



Universidad Metropolitana de Ciencias de la Educación

Facultad de Historia, Geografía y Letras

Departamento de Inglés

THE EFFECT OF MUSICAL TRAINING ON THE LOCATION AND REALIZATION
OF POST-LEXICAL ACCENTUATION IN TEFL STUDENTS

TESIS PARA OPTAR AL GRADO DE MAGISTER EN LA ENSEÑANZA-
APRENDIZAJE DEL INGLÉS COMO LENGUA EXTRANJERA (TEFL)

AUTORA: ANA AGUILERA BELTRAN
PROFESOR PATROCINADOR: HECTOR ORTIZ LIRA

SANTIAGO DE CHILE, 2016



Universidad Metropolitana de Ciencias de la Educación

Facultad de Historia, Geografía y Letras

Departamento de Inglés

THE EFFECT OF MUSICAL TRAINING ON THE LOCATION AND REALIZATION
OF POST-LEXICAL ACCENTUATION IN TEFL STUDENTS

TESIS PARA OPTAR AL GRADO DE MAGISTER EN LA ENSEÑANZA-
APRENDIZAJE DEL INGLÉS COMO LENGUA EXTRANJERA (TEFL)

AUTORA: ANA AGUILERA BELTRAN
PROFESOR PATROCINADOR: HECTOR ORTIZ LIRA

SANTIAGO DE CHILE, 2016

AUTHORIZATION FOR REPRODUCTION

2016. Aguilera Beltrán Ana Luisa

Total or partial reproduction of this material, for academic purpose, by whatever means is authorized, provided the bibliographic reference attesting this work and its author is made

DEDICATION

I would like to dedicate this work to my parents, my mother Iris and my father Luis for their unconditional support and for having instilled in me the desire to learn.

ACNOWLEDGEMENTS

This dissertation could not have been produced without the invaluable help of family, principally my son, Cristián and my parents. My son was always willing to help me with his immense scientific knowledge and my parents were eager to listen to my ideas and encouraged me to follow my beliefs. I also want to thank my supervisor, Hector Ortiz for his comments and criticism, my colleague Pablo Corvalán, for being so helpful and supportive, and the teacher Daniel Miranda for his help with the musical aptitude test and ideas for the research. Finally, my indebtedness to my friends, Helen Grover who supported me and helped me by proof reading and Adrian Olea who helped me with statistics, charts and tables and also supported me. Without them, I would not have reached this stage.

Ana Luisa Aguilera Beltran

ABSTRACT

ABSTRACT

The present study examines the effectiveness of a musical method to train location and realization of post-lexical accentuation. There is lack of empirical evidence regarding the connection between music and the suprasegmental features of the English language. This research seeks to contribute to evidence in current pedagogical practice in relation to the topic. To do this, a quasi-experimental study was carried out. Two groups of year 3 TEFL students from UMCE were compared: One of them, the experimental group, had a pedagogical intervention using musical training. The other group had no musical training whatsoever. Both groups continued having the traditional training provided at the university. The different analysis of the results obtained by the experimental group under the application of the pedagogical intervention, revealed significant effects in comparison to those obtained with the traditional method in the control group.

KEYWORDS: musical training, post-lexical accentuation, location, realization.

RESUMEN

El presente estudio examina la efectividad de un método musical para el entrenamiento en localización y producción de acentuación post léxica. Existe una gran falta de evidencia empírica en cuanto a la conexión entre la música y las características suprasegmentales del idioma inglés. Esta investigación busca contribuir con evidencia relacionada con el tema en la práctica pedagógica. Para hacer esto un estudio cuasi-experimental fue llevado a cabo. Dos grupos de alumnos de 3er año de pedagogía en inglés de UMCE fueron comparados. Uno de los grupos, el grupo experimental, tuvo una intervención pedagógica usando un método musical. El otro grupo no tuvo ningún tipo de entrenamiento musical. Ambos grupos continuaron con el entrenamiento tradicional otorgado en la universidad. Los distintos análisis demostraron que los resultados obtenidos por el grupo experimental bajo la intervención pedagógica revelaron efectos significativos en comparación a aquellos obtenidos por el grupo control con el método tradicional.

PALABRAS CLAVE: entrenamiento musical, acentuación post léxica, localización, producción.

TABLE OF CONTENTS

CHAPTER 1: INTRODUCTION

1.0 Preliminary remarks

During my years of experience as an EFL teacher, I have noticed that learners who have a “good ear”, understood as a high musical aptitude, have outstanding pronunciation skills and show a certain ability to reproduce intonation patterns. There is a fair amount of evidence regarding the relationship between musical aptitude and a good pronunciation of segments, e.g. Mackenzie (2003) and Milovanov et al. (2008). Unfortunately, concrete evidence on a similar relationship involving prosody and its possible correlation with musical aptitude is not so abundant. Furthermore, in a research on the relationship between musical skills, music training, and intonation analysis skills, Dankoviková et al. (2007) state that musical training as part of phonetic training could enhance the students’ ability for intonation. In order to fulfil that need, it is my role as an EFL teacher to investigate this particular aspect of teaching.

As a teacher at Universidad Metropolitana de Ciencias de la Educación (UMCE), I have observed that there are a considerable number of students with outstanding musical abilities; there are several musicians, singers, and students who started to like English simply because their favourite singers sang in English. At UMCE, students go through a six-semester phonetics course, which makes it the ideal place to do research on intonation acquisition. Moreover, a serious lack of location and realization of post-lexical accentuation placement has been reported. As part of their training, students are expected to handle the so-called ‘tonetic-stress marking system’ (Kingdon, 1958), that is based on the principle that a mark is placed before a syllable indicating stress by its presence and tone by its form. According to Ortiz (personal communication) most students are able to correctly mark accents in a text after going through training but when they are asked to read the same text and interpret the marked accents they fail to produce them accurately. Generally, they fail to associate the correct pitch direction and pitch range with the form of the mark, or associate the presence of the syllable bearing the tone mark with some type of pitch movement. These students would therefore benefit from additional training for pitch

accent realization. The study which I propose here aims to investigate whether implementing a musical method will be beneficial to TEFL students' acquisition of some of the essential prosodic features that they are expected to operate.

1.1 Statement of the problem

The acquisition of intonation in EFL is a particularly difficult task. It requires the learner to know which words to highlight, when the pitch of the voice rises and falls, and how to use this variation to convey pragmatic meaning. Proper handling of prosodic features (e.g. pause, pitch, and loudness) can help deliver the intended message appropriately.

On the other hand, a crucial factor to convey meaning involves the last accent in an intonational phrase; the incorrect placement of nuclear accents can render a totally different idea (as in, for instance, *Why don't you EAT children?* and *Why don't you eat CHILdren?*). In addition, there are many differences in the way Spanish and English assign the location of this accent (as in, for instance, *I forGOT to LET the DOG outside*, which in Spanish would be *olviDE deJAR el PERro aFUEra*). Wells (2006) states that learners generally transfer the prosodic features of their mother tongue to a second or foreign language; therefore, in this case a Spanish speaker of English would place the nuclear accent on the last word in the intonational phrase (*outSIDE*). In addition, Wells points out that when the prosodic features of the mother tongue are transferred to the foreign language the result is a foreign accent. In order to avoid this, learners who aim at near native performance must get acquainted with the phonetic and phonological aspects of prosody.

Wells (2006) states that if learners study pronunciation at all, they usually concentrate on segmental phonetics but not on intonation. This is mainly because the teacher fails to teach intonation and the learners fail to learn it. Fortunately, at UMCE, TEFL students must go through a thorough study of segmental and prosodic phonetics and phonology throughout the curriculum; therefore, it is a suitable place to do research on the acquisition of intonation and discover if using a musical method to teach prosody is beneficial to students.

1.2 Hypothesis

It is hypothesized that TEFL students who are given explicit musical training with a method similar to that postulated by Martenot will improve their oral production skills through the location and realization of prenuclear and nuclear accents.

1.3 Research questions

The research questions were divided into main questions and subsidiary questions.

1.3.1 Main questions

- Is musical training with a method similar to that postulated by Martenot more effective than the traditional training being used at UMCE?
- Has the musical training method been beneficial to students' location of post lexical items?
- Has the musical training method been beneficial to students' oral interpretation of tone?

1.3.2 Subsidiary questions

- Which activities of this musical method do students find more useful?
- Are students with high musical aptitude more benefited from the use of a musical method than the students with medium or low musical aptitude?
- What are the results obtained by students with low musical aptitude when exposed to a musical method?

1.4 Objectives

1.4.1 General objective

The aim of this study is to investigate whether using a musical method to train TEFL students to place and realize pitch accents appropriately benefits students' English accentuation.

1.4.2 Specific objectives

The above aim entails the following specific goals:

To observe the correlation of the marks of weakest students of the experimental and control groups in the intonation workshop before and after the intervention.

To identify the activities which contributed the most to improving students' performance.

To detect differences among the results obtained from the weakest students of both groups under the different kinds of instruction.

To detect differences among the results obtained from the students with high, middle and low musical aptitude in the experimental group.

CHAPTER 2: THEORETICAL FRAMEWORK

2.0 Introduction

This chapter is divided into two sections. In 2.1, prosodic features such as intonation and accentuation are discussed, including, pitch accent, focus and tone. In 2.2, the relationship between language and music is described, together with the musical method, musical aptitude, and a review of neuroscience research. The main purpose of this chapter is to set the base for the research and to clarify what views and approaches this study will be based on.

2.1 Phonological framework

The phonological framework section consists of five different subsections. In the first subsection, I will provide definitions of intonation by different authors, mentioning the difficulties that non-native speakers undergo when learning a foreign language and the need to have a native-like intonation. In the second subsection, I will describe the marking system that will be used throughout this dissertation. Pitch accents will be dealt with in the third subsection, to continue in the following subsection with the notion of focus and its different types, presenting the contributions to the theory and views of the most influential authors in the field. Finally, I will explore the concepts of nuclear accent and nuclear tone.

2.1.1 Prosody

Speech varies in terms of four auditory features: pitch movement (i.e. falling and/or rising), loudness (i.e. loud and/or soft), quality (i.e. strong and/or weak), and duration (i.e.

long and/or short), which in turn are responsible for mainly five types of prosodic features: accentuation, intonation, rhythm, tempo, and pause.

Prosody is present in connected speech all the time. People speak more quietly if they do not want to be heard and speak louder if they want to emphasize. Speakers speed up when they are impatient or excited and slow down when they are sad or depressed. All intonation languages (such as English and Spanish) make use of the elements of one of the prosodies: intonation. Wells (2006: 1) defines intonation as ‘the melody of speech’, i.e. ‘the pitch of the voice rises and falls’, and explains ‘how speakers use this pitch variation to convey pragmatic meaning’. A more phonological definition is provided by Ladd (2008: 4): “the use of suprasegmental phonetic features to convey ‘postlexical’ or sentence-level pragmatic meaning in a linguistically structured way”. In addition, a view that is shared by various authors in England and was proposed by Halliday (1967) is that intonation entails the interaction of three subsystems – tonality, tonicity and tone. Tonality is the segmentation of discourse into a sequence of intonational phrases. Tonicity is the location of the most prominent word in each intonational phrase (IP), and tone is the contrastive movement of pitch on the tonic (or nuclear) syllable. This dissertation has to do with tonicity, i.e. nucleus placement.

Different languages have different prosodic characteristics; therefore, learning to speak a foreign language can be troublesome in this respect. By combining pitch levels and contours, speakers express a variety of intonational meanings, breaking the utterance into chunks, focusing on some parts of it indicating which part of the message is background information and which is foreground. Wells (2006) states that learners frequently tend to transfer the prosodic features of their mother tongue to a second or foreign language. When mother tongue prosodic features are transferred to the foreign language the result is a

foreign accent. According to Wells (2006), native speakers expect non-natives to make mistakes in the pronunciation of segments but not on prosody; moreover, he claims that English speakers assume that when it comes to intonation people mean what they say; this is why some native speakers may misinterpret the spoken message of a non-native speaker of English. In conclusion, it is of great importance for advanced speakers of English to acquire prosodic features of English.

2.1.2 The marking system

At this point, it becomes necessary to mention that the notation marking system used in this dissertation is mainly the ‘tonetic stress marking system’, recently referred to as ‘tonetic accent marking system’ by Cruttenden (2014). I will use the latter term so as to not mislead the reader into confusing sentence accent with word stress. I have chosen this system principally because of its simplicity and because it fulfils two functions: each mark shows accentuation, as well as the pitch movement associated with it. It is a broad type of intonational transcription since marks are given only to accented words, while prominent and non-prominent syllables are left unmarked, with the optional use of [°] to indicate rhythmic beats in the tail. In this and the next chapters I will be using the following types of pitch accents to represent nuclear tones: two falling [ː], [ˑ], and two rising: [˒], [˓]. For the sake of simplicity, all pre-nuclear accents will be marked with [ˑ].

2.1.3 Pitch accents

Since the main objective of this study is the realization of pitch accents, it is crucial to define them and then refer to the notion of nuclear accent and nuclear tones. Cruttenden (1997: 14) defines pitch accents as ‘syllables that are made prominent for linguistic

purposes’ and goes on to explain that ‘pitch accents depend on some sort of obtrusion of pitch at the point of accent from the pitch of surrounding syllables. Such obtrusions depend on movement to or from the accented syllable involving a step-up, a step-down, a movement down-from, or a movement up-from. Accents may involve a movement to or a movement from alone, or a combination of both types of obtrusion’ (Cruttenden 1997: 40). Another definition is provided by Ladd (2008: 48): “A pitch accent may be defined as the local feature of a pitch contour – usually but not invariably a pitch change, and often involving a local maximum or minimum – which signals that the syllable with which it is associated is prominent in its nature”. All of this indicates that pitch accents are the backbone of intonation.

2.1.4 Focus

When speakers engage in conversation they direct their hearer’s attention to the more meaningful portions of their message, i.e. they bring syllables, words, phrases, and even sentences into focus. The term focus was first used by Halliday (1967) when he used it as ‘points of information focus’, in reference to the way in which intonation relates to information structure in spoken language. Years later, Gussenhoven (2007) expressed that native speakers of English direct their listener’s attention to parts of the message by means of nucleus placement. Its location indicates the size of the focus constituent or focus domain; in other words, all the material in the IP which is in focus. Gussenhoven (1983) maintains that accents, both prenuclear and nuclear, are assigned not to words but to focus domains which are formed from three types of components: arguments (NPs), predicates (VPs) and conditions (AdvP), e.g. in John met Mary at the supermarket, all three components are likely to be accented if they form part of the focus domain; however,

accents on John and supermarket (and not on Mary) are also possible, which means that within the focus domain there are components that may not take an accent. He also stated that the size of the focus is expressed through de-accentuation of constituents after the focus; therefore, predicates are usually not accented when they are supporting a focused argument and the relation between the pitch accents and the focus is mediated through the predicate-argument structure of the sentence, e.g.

(2.1) My `tyres have been cut.

(2.2) Your `trousers are torn.

Additionally, Gussenhoven distinguished three different focus meanings: whether the information represents new information, or a correction of existing information; whether the information reflects a change in the world, or a change in the hearer's knowledge about the world, and whether the knowledge about the world is immediately or potentially relevant. In a similar vein, in his 'Focus-to-Accent' (FTA) approach, Gussenhoven (1983) distinguishes the pragmatic/semantic notion of focus, from the phonetic/phonological definition of accent and allows focus to apply to larger portions of utterances. In Ladd's terms 'the FTA approach accepts the premise of the highlighting view that the location of sentence stress is always in some sense meaningful, and eliminates the implications of the normal stress view that there is a fundamental difference of kind between normal stress and contrastive stress' (Ladd, 2008: 218). Thus, normal stress will be understood as broad focus and contrastive stress as narrow focus.

2.1.5 Broad focus and the LLI rule

Ladd (1980) states that when an utterance is in broad focus the whole of the IP is in focus, mainly because all the information in the IP is new. Closely related to the idea of broad focus is the last lexical item rule (LLI). Halliday (1967) was the first author to categorize it. This rule proposes that the last lexical item in an utterance is the one that receives the nuclear accent, e.g.

(2.3) There's a 'question I 'don't under`stand.

In (2.3) the whole of the IP is in focus; therefore, the nucleus goes on the last lexical item.

There are two instances when the LLI rule does not apply. The first one being when the element is given, i.e. it has been already mentioned, and when it is contrastive.

The most important considerations will be the notions of narrow focus, which I will refer to later, and the exceptions to the LLI rule, due to the fact that the realization of the nuclear accents in those cases is problematic for TEFL students whose mother tongue is Spanish. According to Ortiz (personal communication) 'students seem to have problems particularly when the nucleus is advanced, because in Spanish, the tendency is to accent the last word'. Consequently, I will refer to some of these exceptions, considering the most troublesome cases, i.e. the exceptions that have broad-focus versions in Spanish and take the nuclear accent on the last lexical item.

2.1.6 Exceptions to the LLI rule

This section explores utterances in which the nuclear accent is placed before the last lexical item. Mainly, sentences made up of noun phrases acting as subjects and predicates, as well as final items with low semantic weight, such as utterances with transitive verbs+object+adverbial particle.

2.1.6.1 Event sentences

Gussenhoven (1984: 42) defines event sentences as those referring to historical events, i.e. those in which “something was (is, will be, might have been, was not, etc.) an event”. Notice that in (2.4) and (2.5) the predicates are unaccented, e.g.

(2.4) Our `bus's coming.

(2.5) Your `dog's barking.

2.1.6.2 Wh-questions ending in a verb

In these type of questions, the nuclear accent goes on the noun that represents the object, e.g.

(2.6) How much `water do you drink?

(2.7) Whose `car did you borrow?

Spanish speakers would tend to place the nuclear accent on the verbs ‘drink’ and ‘borrow’.

2.1.6.3 Final Relative Clauses

In this type of clauses, the accent generally goes on the noun. Again, in this case, Spanish speakers would place the nuclear accent on the last word.

(2.8) What about that `woman you were going out with?

2.1.6.4 Nouns + adjectives and participles

In (2.9) and (2.10), the nuclear accent goes on the noun preceding the participle. Spanish speakers would tend to place the nuclear accents on the adjectives, i.e. ‘loose’ and “unlocked” respectively.

(2.9) You for'got to let the `dog loose.

(2.10) You left the `door unlocked.

The Spanish versions of the sentences above have the nuclear accent on the last lexical item.

(2.11) Olvi'daste dejar el perro `suelto.

(2.12) De'jaste la 'puerta sin `cerrar.

2.1.6.5 Transitive verbs+object+adverbial particle

This type of construction consists of a transitive verb followed by a direct object and an adverbial particle. In connected speech, the accents regularly go on the verb and the nominalized direct object as in (2.13), and on the verb and the particle if the object is pronominalized as in (2.14).

(2.13) She 'must have 'turned her `mobile off.

(2.14) 'Pick it 'up and 'throw it a way.

2.1.7 Narrow focus

The term ‘narrow focus’ was proposed by Ladd (1980) but the notion was already known under the name of ‘marked tonicity’ (Halliday, 1967). When an IP is in narrow focus only a portion of the information provided in the utterance is new and therefore in focus. Cruttenden (1997) points out that narrow focus works in a very similar way to broad focus except that for several reasons some portion of the IP is considered to be out of focus

(for instance, because it has been mentioned in the preceding IP). That part of the IP which is in focus will, like broad focus, take the nuclear accent on the LLI, e.g.

(2.15) A: 'What has `Santa brought you?

B: He's brought me a `doll.

In (2.15) only 'a doll' is new information, the rest, is given, therefore, the focus in the following IP is narrowed down to a single word 'doll'.

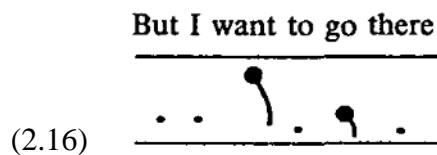
2.1.6 Nuclear accent and nuclear tone

As the term 'pitch accent' has already been defined, it is now necessary to refer to the types of pitch accents, i.e. nuclear and pre-nuclear accents. It is also relevant to refer to what will be understood by nuclear tone. I will explain this in the latter part of this subsection.

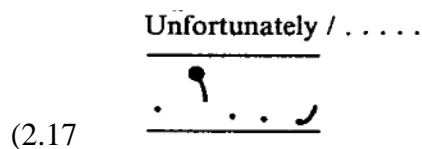
The term nuclear accent has received multiple names, ranging from "tonic syllable" Halliday (1967) to 'sentence stress' Ladd (2008). In this study I will use 'nuclear accent' to differentiate it from the term 'word stress', which refers to the 'potential for accent' (Cruttenden, 1997: 14). In order to define 'nuclear accent' I will consider two definitions which, in my opinion, have different perspectives. Firstly, Cruttenden (1997: 42) states that nuclear accent is 'the pitch accent which stands out as the most prominent in an intonation-group'. Later, in more functional terms, he defines it as 'the end of the new information' (Cruttenden, 2014: 286). Secondly, I will consider a phonological view proposed by Gussenhoven, who defines it as 'chief means of signalling the focus marking'

(Gussenhoven, 1984: 22). This means that the nuclear accent is a way in which speakers draw their listeners' attention to the focus of information in an utterance.

Pre-nuclear accents are those that occur before the nuclear accent. Nevertheless, there are cases in which the last accent, the nuclear accent, can be downgraded and a previous pitch accent (pre-nuclear) can be more prominent. Cruttenden (1997: 42) mentions two cases which are the most common ones. I refer to them because these cases received special attention in the study. The first one occurs when a movement down-from with a very wide glide is followed by another movement down-from but with a narrower glide, e.g.



In this case the first fall is likely to be heard as more prominent than the second. The second type of sequence to be considered occurs when there is an accent down-from followed by an accent up-from (called either a fall-rise, or a fall plus rise in British contour analysis), e.g.



A rise in pitch occurs in -ly which is an unstressed syllable in the word and not potentially accented. The syllable -ly is not taken as accented but as a mere part of the realization of the tune following the accent on -fort.

One of the main problems to be dealt with in this study is that TEFL students who are Spanish speakers tend to place the nuclear accent on the last words of sentences; this can be considered the default pattern. As Ortiz (1995:2) states ‘in Spanish the nuclear accent tends to fall on the last content word not only of constituents and sentences in broad focus, but also very often of sentences which are in narrow focus’; it is extremely difficult for Spanish speakers to realize nuclear accents appropriately when there are exceptions to the LLI rule and in sentences in narrow focus when the nucleus is advanced. These kind of sentences received special emphasis during the pedagogical intervention sessions and were included to be assessed in the post-tests.

Closely related to the notion of nuclear accent is that of nuclear tone. The British school of prosody defines nuclear tone as ‘the pitch movement which begins on the nuclear syllable and is completed either on that same syllable if there is no tail, or on the following syllables if there is a tail’ and, according to Cruttenden (1997: 50) ‘involves the major part of the meaning contributed by the pitch pattern of an intonation group’.

2.2 Musical framework: introduction

The following section is divided into four parts. First, I will refer to the relationship between music and language, I will compare and examine the views of some of the most influential authors in the field. In the second subsection, I will refer to the musical method used in the research and the reasons why it was chosen. In the third subsection, due to its relevance for the present research, I will review some of the latest findings in the field of neuroscience, regarding the relationship between music and language. Finally, I will look into the latest studies in relation to the connection among musical aptitude, musical training, and linguistic skills.

2.2.1 Music and language

In comparing the acquisition of music and the acquisition of speech, one must take into consideration the similarities of music and speech. Music and spoken language are both aural phenomena and thus share common characteristics. The rhythm and melody of music can be compared to stress and intonation (Arleo, 2006). Intonation is music. When we talk about English intonation we mean the pitch patterns of spoken English, the speech tunes or melodies, the musical features of English. Fonseca (2000) states that both, language and speech stem from the processing of sounds, they are used by their authors/speakers to convey a message, although language is much more precise than music, whose effect is mainly emotional. Fonseca (2000: 147) also points out that music and language have intrinsic features in common, such as pitch, loudness, prominence, stress, tone, rhythm, and pauses. Another shared feature of language and music is that we learn both of them through exposure. No language can be acquired without oral or written input and in a similar fashion, we acquire our notions of music from what we hear around us, which is why music from other cultures often sounds strange to us when it is different from the patterns of sounds and rhythms to which we have grown accustomed.

2.2.2 The musical method

The musical method used consisted on a series of exercises and activities adapted from the Martenot musical method, Gilbert video and others of my own creation. In what follows, I will describe them briefly.

The idea of using a musical method came from the idea behind Melodic Intonation Therapy (MIT). This is a method that was developed in the year 1973 by the neurological

researchers Sparks, Helm, and Albert to help patients suffering from aphasia, a disorder characterized by the loss of ability to produce and/or comprehend language. This treatment uses the musical elements of speech (melody & rhythm) to improve expressive language by capitalizing on preserved function (singing) and engaging language-capable regions in the undamaged right hemisphere. The idea of this research study was to do exactly that, i.e. to use singing and other musical elements to engage the regions of the right hemisphere and improve language; therefore, the musical method that was used was one that helped to link these two aspects. According to Patel (2011) essential conditions must be met in order for musical training to drive adaptive plasticity in speech processing networks. Musical training can involve different skills depending on what instrument and what aural abilities are being trained; therefore, the benefits of musical training will depend on the particular acoustic features emphasized in training, the demands that music places on those features in terms of the precision of processing, and the degree of emotional reward, repetition and attention associated with musical activities. Some elements from the Martenot musical method fulfil these purposes and include language exercises associated with rhythm and intonation as well, thus serving the purpose of linking music and language in a gradual way, starting with auditory training and finishing with accurate production. Martenot (1957) proposes to arouse the musicality of the students through games and playful musical proposals in which music, melody, and harmony are presented in a separate way. Music is understood as energy liberating, a powerful factor of harmony and balance which allows the students to express themselves freely and train their hearing before getting into intonation. Martenot poses that an appropriate intonation depends on accurate listening and he goes on to explain that this should be achieved following a certain order. The first

element to be dealt with should be rhythm. The idea, according to this author, is to express the living rhythm inside every human being.

One of the advantages of the Martenot method for this study in particular, is that it includes the memorization of rhythmic patterns and relates them to phrases; thus, connecting rhythm to language. These phrases were included during the rhythmic phase of the intervention in order to make participants feel the rhythm inside. As was mentioned earlier in this section, Patel (2011) points out that the benefits of musical training will depend on the acoustic features emphasized; therefore, the acoustic feature to be emphasized with this particular feature of the method is rhythm.

Gilbert (2011) proposes the use of the kazoo for training pitch accent realization, as well as the idea of choral repetition to ensure confidence. According to her, students feel more confident when they are repeating in a group; choral repetition helps learners to build confidence because they have the support of the group. These ideas were also used during the sessions.

In addition to all the aforementioned elements, some other activities of my own creation and adaptation were included, such as the use raps, popular songs, and nursery rhymes for pitch accent identification and the use of the kazoo for reading the three-stage Montessori cards.

2.2.3 Research on neuroscience

There are numerous studies from the field of Neuroscience regarding the relationship between music and language. Näätänen et al. (2005) state that each sound repetition, both speech and non-speech, develops its neural representation in the auditory cortex. Without proper neural models formed in the auditory cortex for the phonemic

combinations and prosodic patterns to be pronounced, the learning of a foreign language will not reach the targeted level (Näätänen, 2001: 17). Similarly, a musician needs accurate neural representations for tones in order to be able to learn to play the instrument in tune and in time. This skill is required, for example, with string instruments where the quality of the sound produced depends on the player's ability to listen and correct his/her own production. Thus, perceiving music and speech seem to depend upon subtle and accurate auditory processing skills, enabling the correct production of an intended output. Functional MRI has highlighted, for instance, that similar networks of brain structures are activated by music and language processing (Maess et al., 2001; Zatorre et al., 2002; Koelsch et al., 2002, 2004; Brown et al., 2004; Vigneau et al., 2006). Similar findings have been reported in studies which show that the younger the subjects start playing an instrument, the greater the effect on the brain structure or function (Elbert et al., 1995; Pantev et al., 1998). Nevertheless, in the present study, the participants' age will not have a crucial role in the accuracy of the pronunciation skills; instead, musical aptitude and musical training are supposed to be the key for developing foreign language intonation skills.

Musical training seems to drive adaptive plasticity in speech processing networks. Kraus and Chandrasekaran (2010) raise an important point: years of processing pitch, duration, and timbre in a fine-grained way in music may enhance their processing in the context of speech. Similarly, Patel (2011) states that music-driven adaptive plasticity in speech processing occurs because five essential conditions are met: there is anatomic overlap in the brain networks that process acoustical features used in both speech and music; there is precision: music places higher demands on the networks than does speech in terms of the precision of processing; repetition: music requires constant repetition; emotion: the musical activities that engage these networks produce strong positive emotions and

finally attention: the musical activities that involve these networks need constant attention. Patel also states, when these conditions are met, neural plasticity drives the networks in question to function with higher precision than needed for ordinary speech communication and yet, since speech shares these networks with music, speech processing benefits (Patel, 2011:6).

2.2.4 Musical aptitude and neurolinguistics

Given the structural and acoustical similarities between speech and music and possible overlapping cerebral structures in speech and music processing, the positive impact of musical aptitude and musical training on linguistic skills has been reported by several authors. For instance, a study by Slevc and Miyake (2006) showed a strong correlation between musical aptitude and second language listening discrimination and production skills among native Japanese who were immersed in English after the age of 11. In the same vein, (Anvari et al. 2002) stated that musical training seemed to relate to phonological processing ability in preschool children. More recently, Milovanov et al. (2008) have investigated the relationship between musical aptitude and second language pronunciation and phonemic discrimination skills. Twenty children with advanced English pronunciation skills demonstrated to have better musical skills as measured by the Seashore musical aptitude test than twenty children with less advanced pronunciation skills. In another experiment, probably the closest to this study, Milovanov et al. (2010) examined second language production and discrimination skills in the light of musical aptitude. The study was conducted in university settings in south-western Finland. All the participants performed equally well in the phonemic listening discrimination task. However, the participants with higher musical aptitude were able to pronounce English better than the

participants with less musical aptitude. The results, therefore, imply that musical and linguistic skills are interconnected. In their study the authors suggest that the prosodic features of speech should also be taken into consideration due to their importance and connection to musical features.

The role of possibly shared neural mechanisms between linguistic and musical functions is still unclear, even though there is evidence that musical training improves sensory encoding of dynamically changing sounds, which helps with linguistic coding. During the last decades many researchers from a wide variety of fields have claimed the positive effects that music instruction can have in the learning of languages. There are several studies that recognize that second language pronunciation of segments is better in students with high musical aptitude but there seems to be a lack of research in relation to prosody and an absence of a method that links music and prosody. The present dissertation intends to fulfil both needs.

CHAPTER 3: METHODOLOGY

In this chapter, I will provide a brief explanation of the procedures used to carry out this study, how the groups were formed, the different instruments that were used, the pedagogical intervention, and the data analysis procedures.

3.1 Description of the study

The research corresponds to a semi qualitative and quantitative quasi-experimental research, which aimed at comparing the effectiveness of two different methods for training TEFL students' intonation and sentence accentuation.

There was an experimental group with an independent variable identified as pedagogical intervention, which consisted of eight sessions of training for sentence intonation and sentence accentuation using a musical method. The control and experimental groups went through the current teaching methodology for the intonation course, i.e. they had two sessions of 90 minutes per week with the traditional method. The control group was not to be manipulated through any kind of musical training. The effectiveness of the independent variable was contrasted with the dependant variables, i.e. participants' correct placement of prenuclear and nuclear accents and appropriate tonal realization of pruclear and nuclear accents.

Within its qualitative design, the investigation also included features of correlational descriptive research. It seeks, for instance, to determine the relationship between the level of musical aptitude and better results after the pedagogical intervention.

3.2 Sampling

The participants were seventeen upper intermediate English university students, ten women and seven men. They were selected from the TEFL undergraduate programme at Universidad Metropolitana de Ciencias de la Educación (UMCE) located in Santiago, Chile. As a requirement, the students needed to be participating in the intonation course (sixth semester of the Phonetics course). They had to be native speakers of Chilean Spanish and speakers of English as a foreign language. They were divided into two groups: the control group, with eight participants and the experimental group with nine participants. The participants were selected considering their willingness to participate and their levels of musical aptitude; there were students with different levels of musical aptitude (low, medium, and high) in each group (see section 3.3.1). Both groups were instructed using the same reference examples for sentence accentuation. At the end of the process two post-tests were applied. The course marks for oral production before and after the pedagogical intervention were compared in order to find any possible correlations between them and the results of the post-tests.

3.3 Instruments

To conduct this research three types of methodological instruments were used: a musical aptitude test, which identified students' aptitude in relation to rhythm and melody; a post-training evaluation questionnaire, which provided information in relation to the extent to which the pedagogical intervention was helpful for the participants; and two post-tests, which supplied input in relation to the participants' nucleus placement and realization of nuclear and prenuclear accents. These instruments were assessed during the process, the first before the pedagogical intervention and the two last ones after it.

In what follows, a detailed description of each instrument is provided.

3.3.1 Musical aptitude test

The first step was to measure the level of musical aptitude of the participants. In order to fulfil this purpose, participants were tested using a musical aptitude test provided by the Music Department of UMCE (see appendix A). They were tested in the following parameters: rhythmic memory, auditory memory, and form perception. The participants' performance for each category was measured and the average of their overall performance was used to form the experimental and control groups. The following percentages were considered: High musical aptitude: over 70%, medium musical aptitude: between 40 and 69%, and low musical aptitude: between 0 and 39%.

The distribution of the participants in relation to this test is represented in the charts below. There were four students with high musical aptitude, three with low musical aptitude and one with low musical aptitude in the control group.

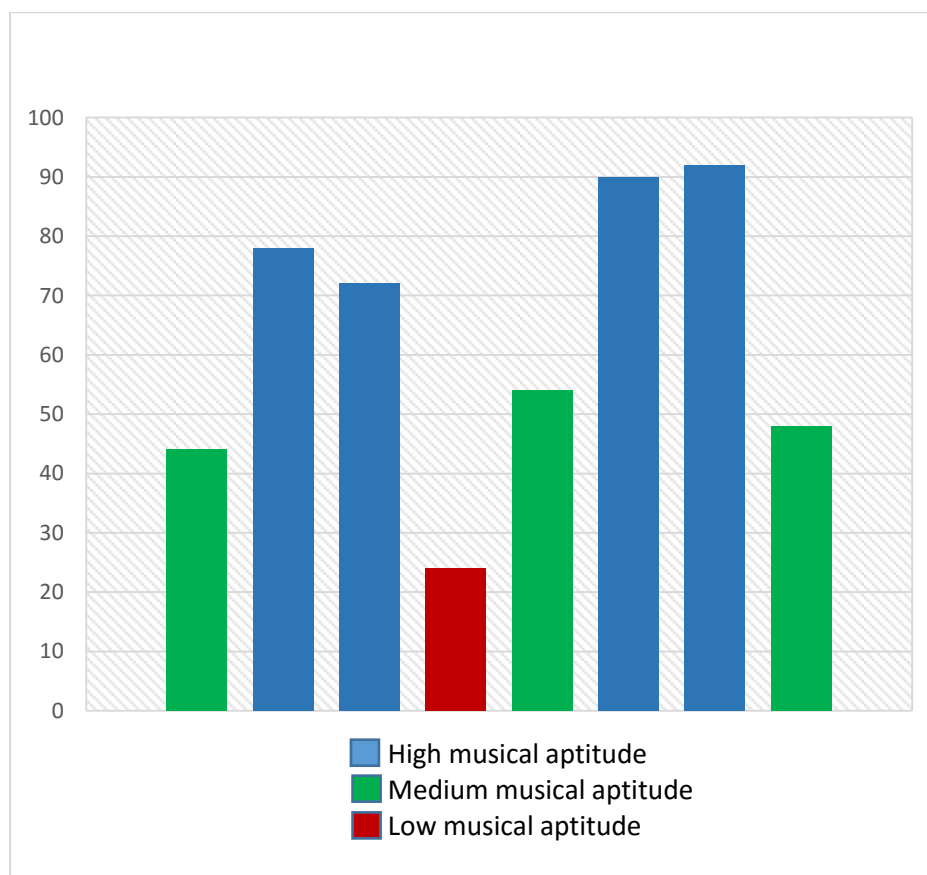


Chart 1. Percentages of musical aptitude in the control group

There were five students with high musical aptitude, one with medium, and three with low musical aptitude in the experimental group.

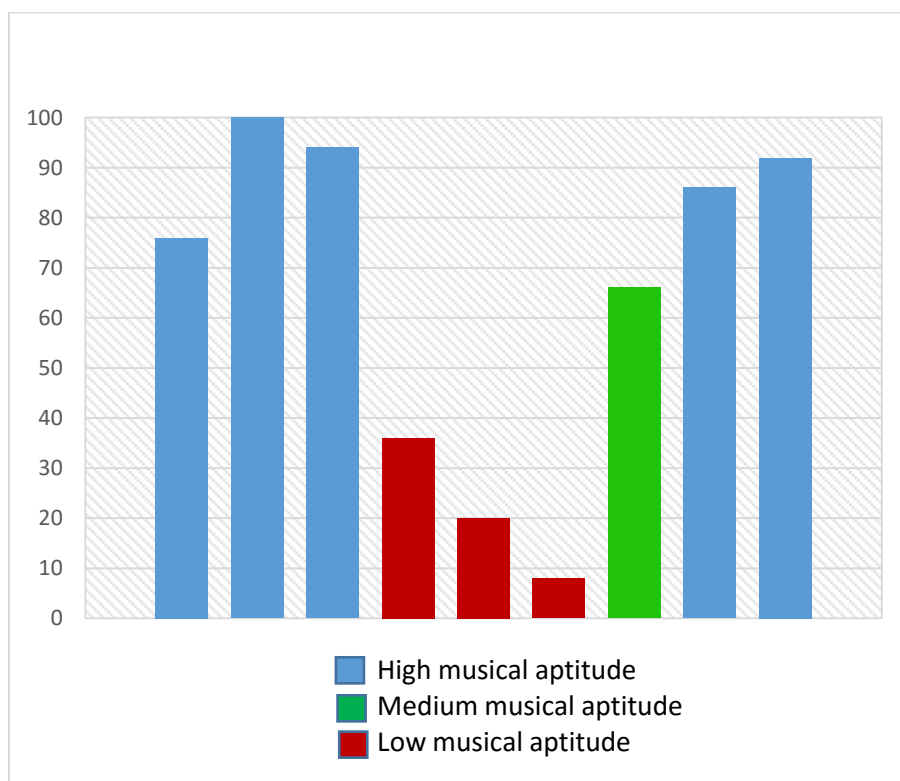


Figure 2. Percentages of musical aptitude in the experimental group

3.3.2 Post-tests

There were two post-tests: post-test 1, which did not show marked accents, where the participants had to read some sentences and a mini dialogue and decide where to locate the prenuclear and nuclear accents and post-test 2, which showed marked accents, where participants had to produce prenuclear and nuclear accents with correct location and pitch. To design the tests, it was considered advisable to resort to sentences and conversational exchanges which provided problematic accentuation patterns for Spanish speakers (see section 2.1.6). Five of these patterns correspond to sentences in broad focus with an earlier nucleus, which are exceptions to the LLI rule, such as event sentences, final relative clauses, wh-questions ending in a verb, nouns + adjectives and participles, and transitive

verbs + object + adverbial particle, and the others, which are sentences in narrow focus such as given information.

In order to test their validity eight sentences and two mini-dialogues were written and then submitted to three native speakers to read and record. During the post-tests, participants from the control and experimental groups were asked to read the sentences. They had five minutes to read the sentences in silence. Then, the sentences were recorded onto a computer programme (a CD containing the recordings of the participants accompanies the dissertation).

Find below sentences for the post-tests 1 and 2

Post-test 1

1. You left the water running.
2. What about that woman you were going out with?
3. Whose car did you borrow?
4. At least you could have turned your mobile off.
5. A: Follow that car!
B: Which car?
A: The blue one with the bad guy in it!

Post-test 2

1. The `kettle's boiling.
2. 'What about that `man you've been dating?
3. 'How much `water do you drink?
4. I for'got to let the `dogs loose.
5. A: Ar'rest that `man!
B: `Which man?
A: The 'tall one with a red `cap on.

3.3.3 Post-training evaluation questionnaire

This instrument measured to what extent the participants considered the pedagogical intervention useful, as well as what activities and resources they found more effective. The results of this questionnaire are relevant for the decision-making process of future training involving this method. In order to interpret the information provided by these tests students' answers were translated into quantitative data. The activities that the student found more useful according to the results provided by this questionnaire are described in detail in section 3.4.2. The questionnaire is included in appendix B.

3.4 The pedagogical intervention

The experimental group had eight sessions of training with the musical method (described in section 2.2.2). The intervention lasted four weeks, each of which was comprised of two sixty-minute sessions. On the other hand, the control group continued with the traditional training and had no additional training.

3.4.1 The procedures applied in the experimental group

The sessions consisted of a series of exercises proposed in the Martenot method, some activities adapted from Gilbert (2011), as well as others of my personal creation (see section 2.2.2). All of them varied in degree of difficulty from session to session and were connected to accentuation and intonation. The first session of the intervention is described below, as well as the activities the participants found more relevant to their learning according to the results provided by the post training evaluation questionnaire. All of the activities are organized in terms of the objective they were intended to achieve. In addition, lesson plan 1 in the format used in the English department at UMCE is enclosed in appendix C. A description of lesson 1 is as follows:

Lesson 1

Objective: to develop the rhythmic sense.

Activity 1: Rhythmic patterns

The teacher produces a rhythmic pattern using syllable *-la*, which participants repeat. Then, they memorize the mentioned pattern and repeat it when the teacher indicates.

Activity 2: Expressive formulas

This activity is a variation of the previous one; this time the participants change the pitch pattern while keeping the same rhythmic pattern. The pitch patterns used involve, for instance, differences between affirmative versus interrogative forms and attitudinal features such as excitement, astonishment, sadness, etc.

Activity 3: Marches

First, participants stand in a circle. The teacher produces a rhythmic pattern and starts to march saying the mentioned pattern while marking the beat by stamping her feet. Students follow the teacher. Then, they march while keeping the rhythm and clapping the rhythmic pattern. Finally, they repeat the activity but this time instead of clapping the rhythmic pattern they tap their right index on their left palm.

Activity 4: Relating rhythmic patterns to language phrases

While marching, participants say phrases such as: *What are you doing?*, *Good afternoon*, *It's getting late*, as if they were part of a song. They march and show the nuclear accent with bodily movements assigned by the teacher, e.g. they lift their arms when the nuclear accent is produced or they raise a fist.

Activity 5: Evaluation

In pairs, participants make up other phrases or sentences that have the same prenuclear and nuclear accents as those in the last activity and they take turns to lead the group.

3.4.2 Activities the students found more relevant according to the results of the post-training evaluation questionnaire

According to the results provided by the post-training evaluation questionnaire the activities that students found the most relevant for their training were those which included

the use of the Kazoo and an activity called bouncing balls. The activities will be described below.

Example of an activity using the kazoo

Objective 1: to locate prenuclear and nuclear accent

Objective 2: to realize pitch accents appropriately

The teacher shows sentences without marked accents on the board and participants take turns to reproduce them using their kazoots using first choral repetition and then individually. After each turn, the teacher marks the prenuclear and nuclear accents the participants are producing and asks the class if they think the accents were correctly located.

Bouncing balls

Objective: To relate musical intonation to sentence intonation

Participants sit in a circle with their eyes closed. The teacher plays a note on the keyboard and one of the participants, selected by the teacher, reproduces the same pitch with the syllable *-bam*, maintaining the sound for four beats. Then, the participant that is sitting next to the one who started, takes a turn trying to keep the same pitch. The sound bounces from one participant to the other for one round until all the participants have a turn. This is repeated four times with different pitches.

3.5 Data analysis procedures

In this subsection I will describe how the results obtained were analysed. First, I will refer to the posts-tests, then I will continue with the oral production averages, and I will finish with the post-training evaluation questionnaire.

First, the recorded material produced by the participants for the post-tests was assessed in terms of correct prenuclear and nuclear accent placement in post-test 1 and appropriate prenuclear and nuclear accent realizations in post-test 2. Each correct prenuclear accent was assigned 1 point and every correct nuclear accent was assigned 2 points. The results were

discussed and agreed upon with the thesis supervisor. Then, the average scores obtained by the experimental and control groups in post-tests 1 and 2 were compared. In addition, the results achieved by the participants of the experimental group with high musical aptitude were compared with those obtained by the participants with medium and low musical aptitude. This was done in order to find out which participants were more benefited by the musical training.

On the other hand, the oral production averages per group before and after the pedagogical intervention were compared in order to detect any possible correlation. In addition, the attainment of the weakest participants from each group was compared in order to find out which of the two types of training had a greater impact for students learning. Finally, the answers to the post-training evaluation questionnaire were quantified and analysed to discover to what extent the participants found the pedagogical intervention beneficial to their learning process.

CHAPTER 4: RESULTS AND DISCUSSION

4.0 Results

This section is divided into four parts. In subsection 4.1, I will present the results obtained by the control and experimental groups in the post-tests 1 and 2. In subsection 4.2, I will turn my attention to the individual results of the experimental group, illustrating the participants' level of musical aptitude and their achievement in terms of number of correct placement and realization of pitch accents. In subsection 4.3, I will compare the oral production mark averages obtained in the intonation workshop by the control group and the experimental group, before and after the pedagogical intervention, as well as the attainment of the weakest students of both groups, in order to determine if they benefited from any of the types of training received. In subsection 4.4, I will examine the results of the post-training evaluation questionnaire. Finally, in subsection 4.5, I will discuss the results previously presented.

4.1 Posts-tests results

The charts below illustrate the results obtained by the control and experimental groups in the post-tests after the pedagogical intervention. The results for post-test 1 are on a scale from 0 to 18 points, where 0 is incorrect prenuclear and nuclear pitch accent placement and 18 is the ideal score. The answers were considered correct with any type of pitch accent (e.g. high fall or low fall) the most important was the correct placement of the accent. The results for post-test 2 are on a scale from 0 to 19 points, where 0 is incorrect prenuclear and nuclear pitch accent realization and 19 is the ideal score.

4.1.1 Results of post-test 1

As chart 3 shows, the experimental group has a higher average score in post-test 1, the test that did not include marked accents. There is a difference of 4.3 points between the two groups.

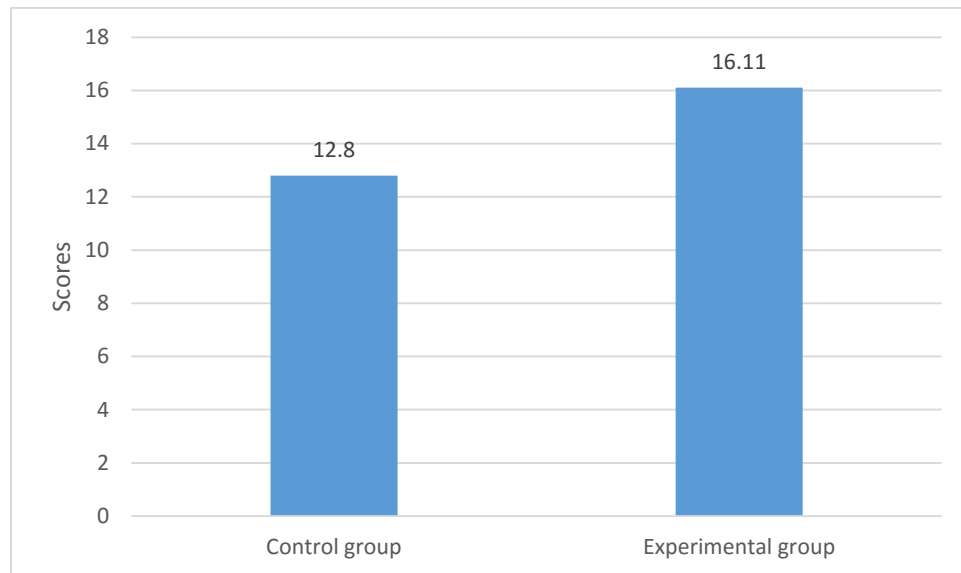


Chart 3. Comparison of the average results of the control and experimental groups for post-test 1

As can be seen in chart 4, the box plot shows the median score for each group, which in this case represents the score obtained by the participants who were in the middle of the distribution. The whiskers indicate the highest and the lowest scores in each group. In this particular case, the highest score of the experimental group ties in with the highest score of the control group, which means there were students who achieved the ideal score for this post-test in both groups. As can be seen in the lower part of chart 4, there were lower scores in the control group than in the experimental group. In the control group the lowest score was 9 and in the experimental group it was 12, i.e. 3 points higher than the control group. The box plot in the experimental group is much higher, which can be interpreted as the result of something different happening to this group; in this case the pedagogical intervention.

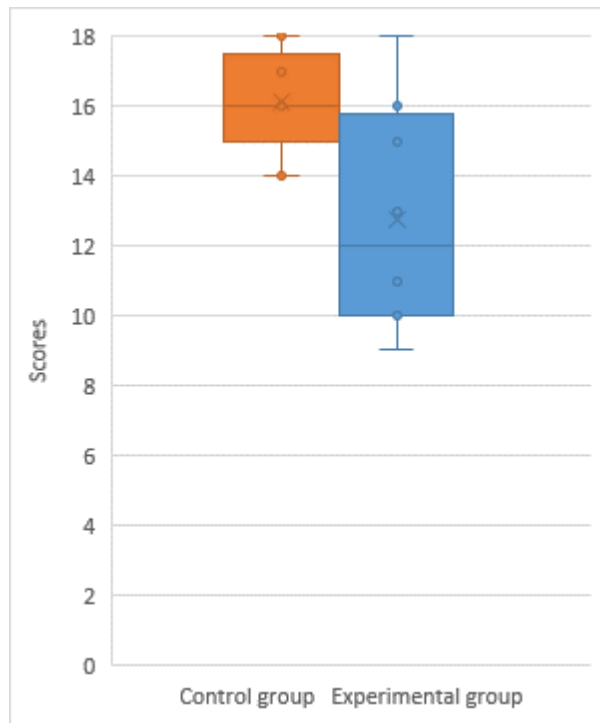


Chart 4. Comparison of the results of post-test

4.1.2 Post-test 2

The findings indicate a favourable difference for the experimental group. The average score of this group was 2 points higher than the control group.

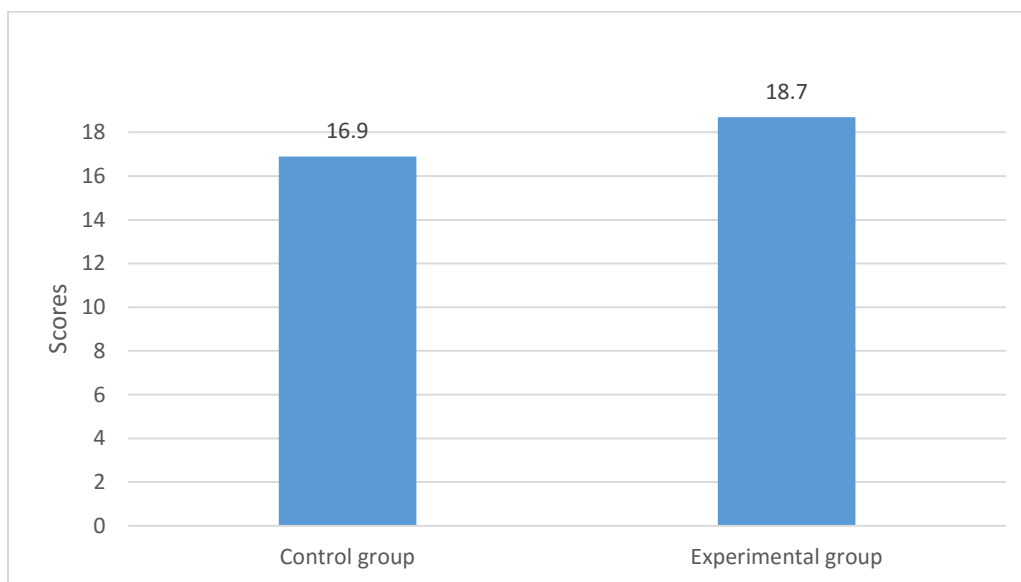


Chart 5. Average results of the control and experimental groups for post-test 2

Chart 6 shows that the box of the experimental group is not visible because the scores were all 19 points, which, as well as being the mean and median score for this group, is the maximum score. The lowest score for this group was 17. On the other hand, the control group has a more widespread distribution of scores. Its median score was 17 and its lowest score was 8. It is relevant to observe here that the experimental group's median score is at the lowest end of the control group scores. Additionally, the median score of the control group is the same value of the lowest score of the experimental group. We can assume that this result was due to the intervention.

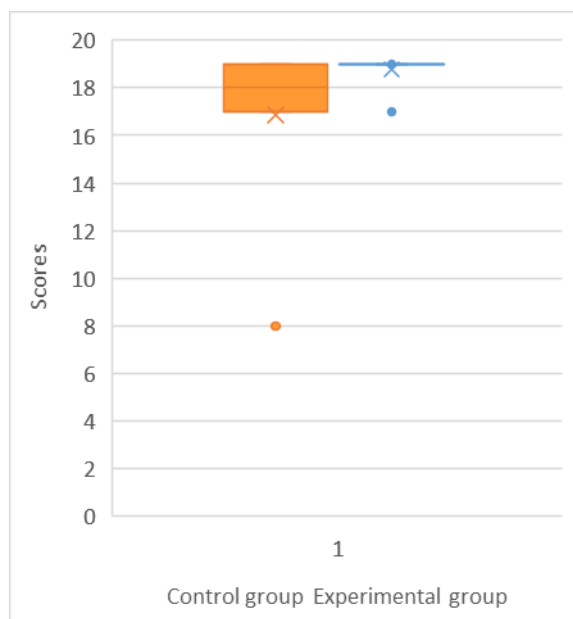


Chart 6. Comparison of the results for post-test 2

4.2 Results of the experimental group for post-tests 1 and 2 according to musical aptitude

The purpose of this analysis is to find possible correlations between the level of musical aptitude and the results of the test to find out whether the musical method was more helpful for participants with high, middle, or low musical aptitude. The percentages of musical aptitude for each participant are included showing high musical aptitude in blue, medium in green, and low in red.

4.2.1 Individual results of the experimental group for post-test 1

Chart 7 shows that two of the students with low musical aptitude from the experimental group obtained the highest scores in this test. Another interesting detail to observe is that the participants with high musical aptitude did not achieve scores as high as the participants with low musical aptitude; the highest score for high musical aptitude is 17.

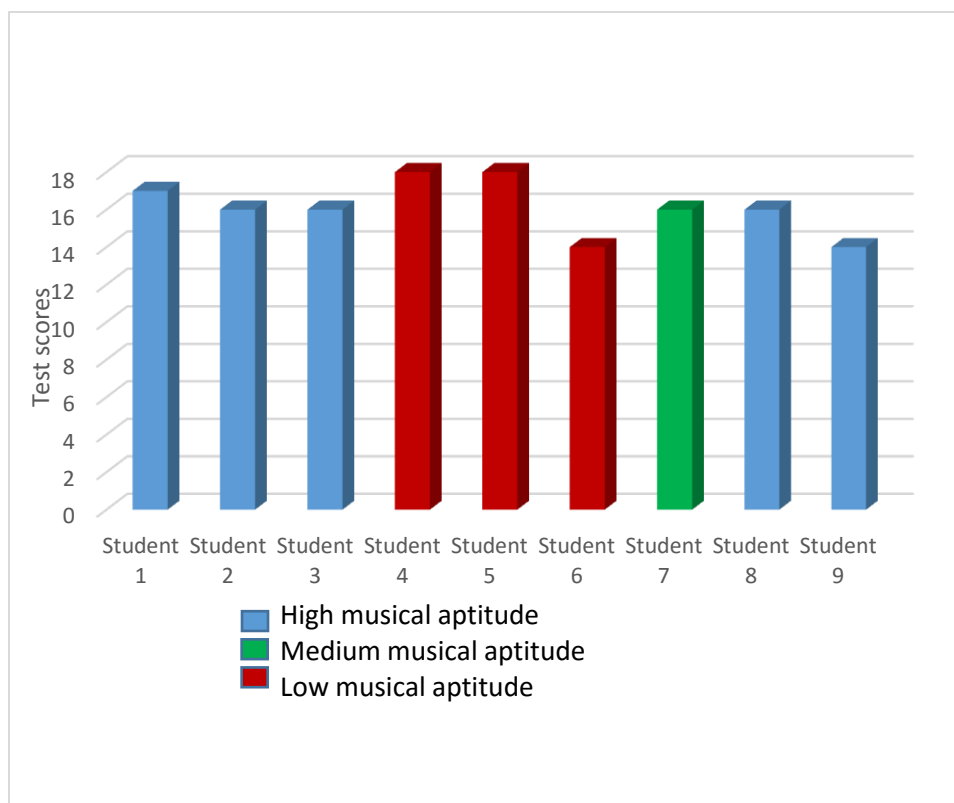


Chart 7. Results of post-test 1 illustrating the level of musical aptitude

4.2.2 Individual results of the experimental group for post-test 2

Post-test 2 differed from post-test 1 because it had marked accents; therefore, the participants did not have to place the pitch accents, they only had to realize the marked prenuclear and nuclear accents appropriately. As can be seen in Chart 8, the results of the experimental group were high for all types of musical aptitude, except for one of the participants with high musical aptitude, who obtained a slightly lower score, 17 points.

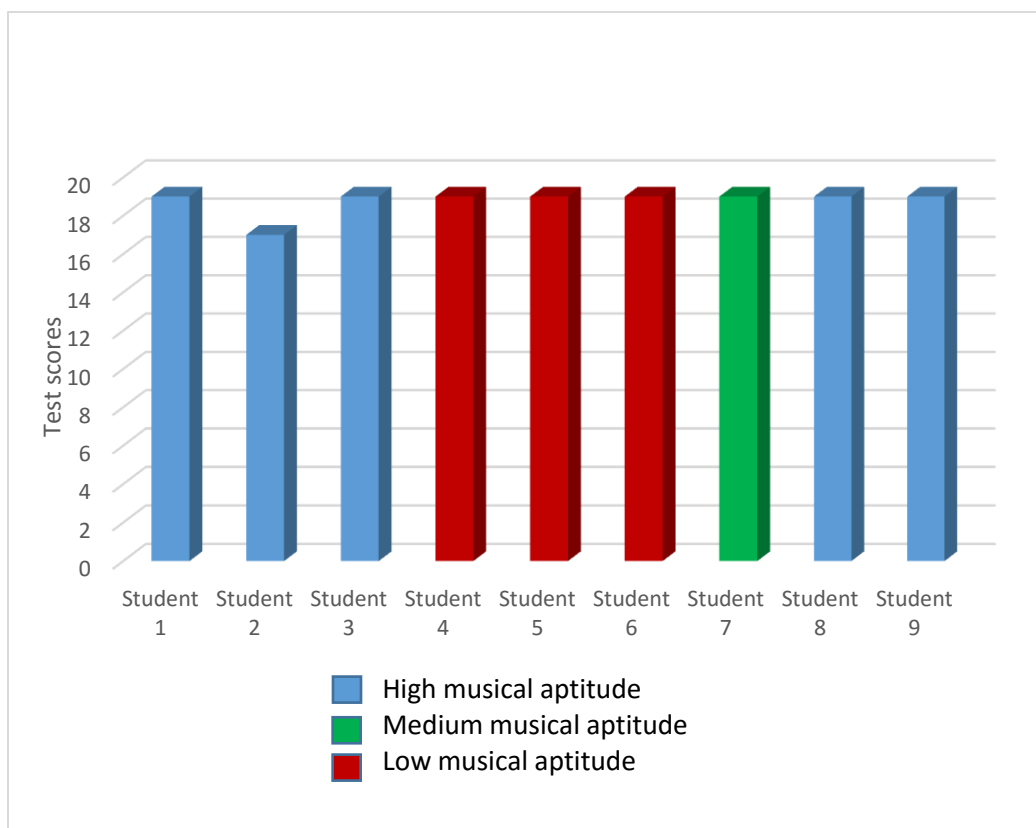


Chart 8. Results of post-test 2 illustrating the level of musical aptitude

4.3 Attainment of control and experimental groups before and after the pedagogical intervention

The charts below give an account of the average marks each group obtained for oral production in the intonation workshop before and after the pedagogical intervention. These averages are on the Chilean scale from 1.0 to 7.0 and they are an indicator of the students' performance in oral production.

4.3.1 Comparison of oral production average marks of the control and experimental groups

Chart 10 shows the mark averages for oral production in the intonation course from the control group before and after the pedagogical intervention. The average is almost the same as in the middle of the semester; it only varied from 6.3 to 6.34.

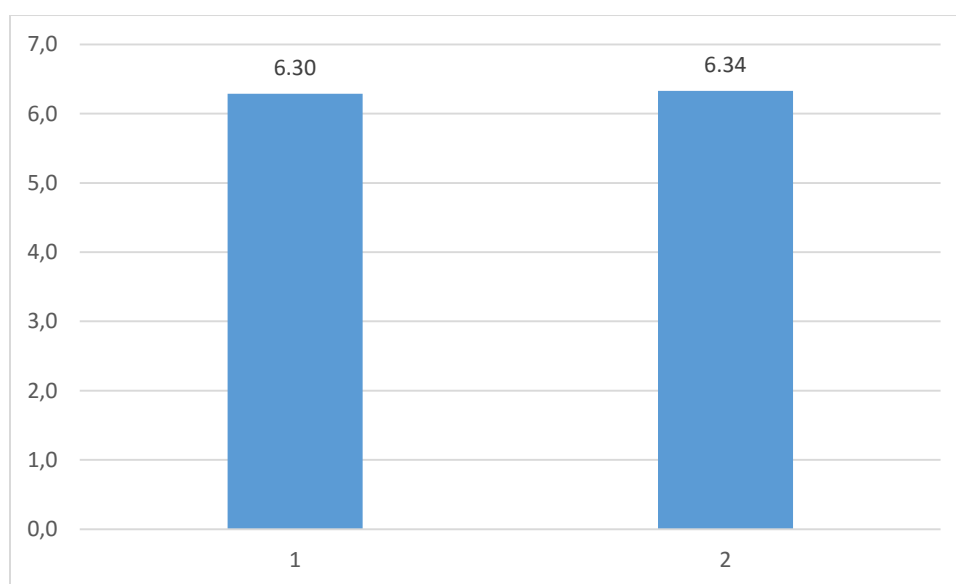


Chart 10. Mark averages for the control group before (1) and after (2) the pedagogical intervention

As can be seen in Chart 11, the average marks of the experimental group had 0.3 increase after the pedagogical intervention.

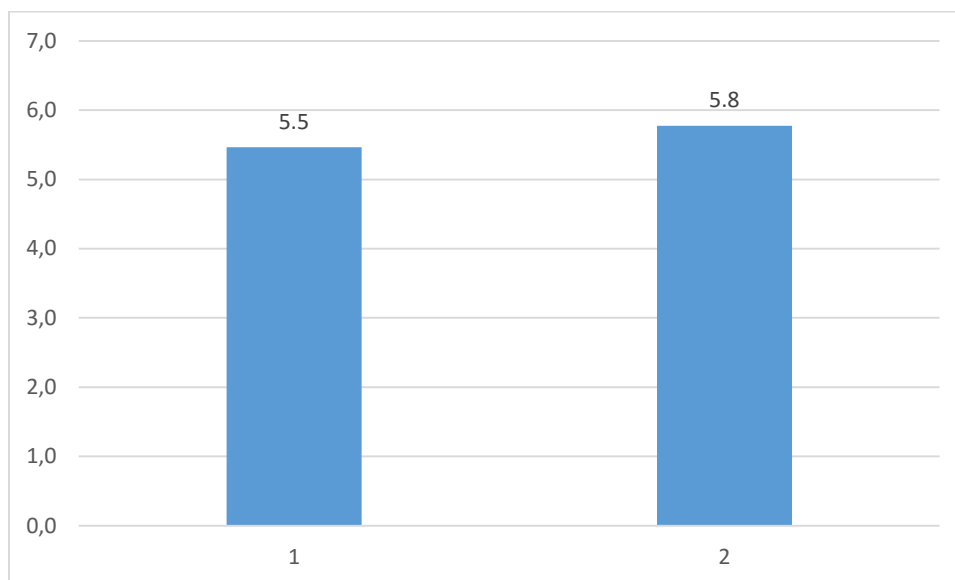


Chart 11. Marks averages for the experimental group before (1) and after (2) the pedagogical intervention

4.3.2 Attainment of the weakest participants of the control and experimental groups in the intonation workshop

The marks of the participants in the control group were comparatively higher than in the experimental group; there were only 3 students whose mark was below 5.8. Therefore, for purposes of this comparison, students were considered weak if they had an average mark below 5.8. As can be seen in chart 12, there were 3 weak students in the control group and their averages increased a maximum of 0.3 after the training with the traditional method. Furthermore, there was a student whose mark increased only by 0.1.

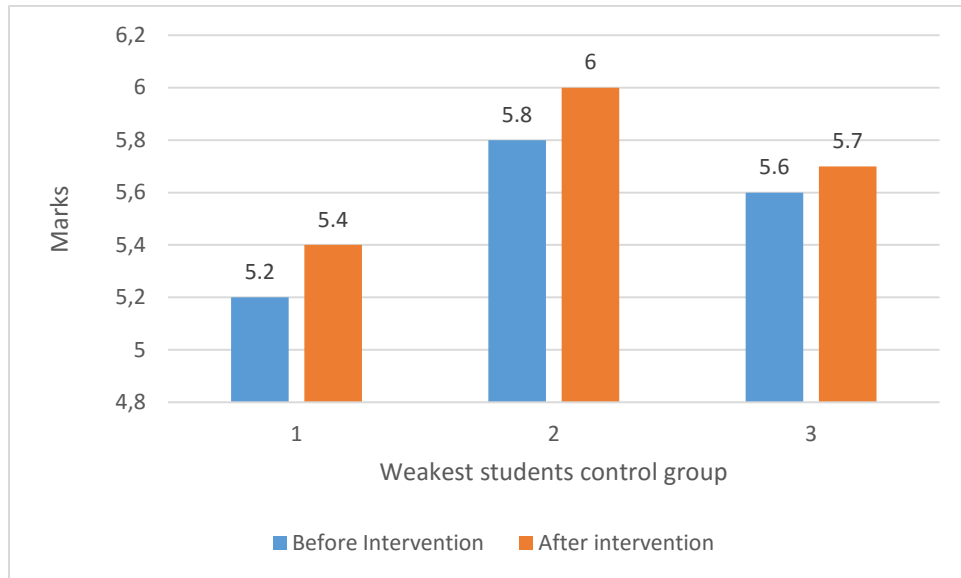


Chart 12. Weakest students in the control group

On the other hand, there were seven students who were considered weak in the experimental group. Chart 13 shows that all weak students had an increase after the pedagogical intervention. Some averages increased as much as 0.8 and the participant that had the least improvement increased by 0.2.

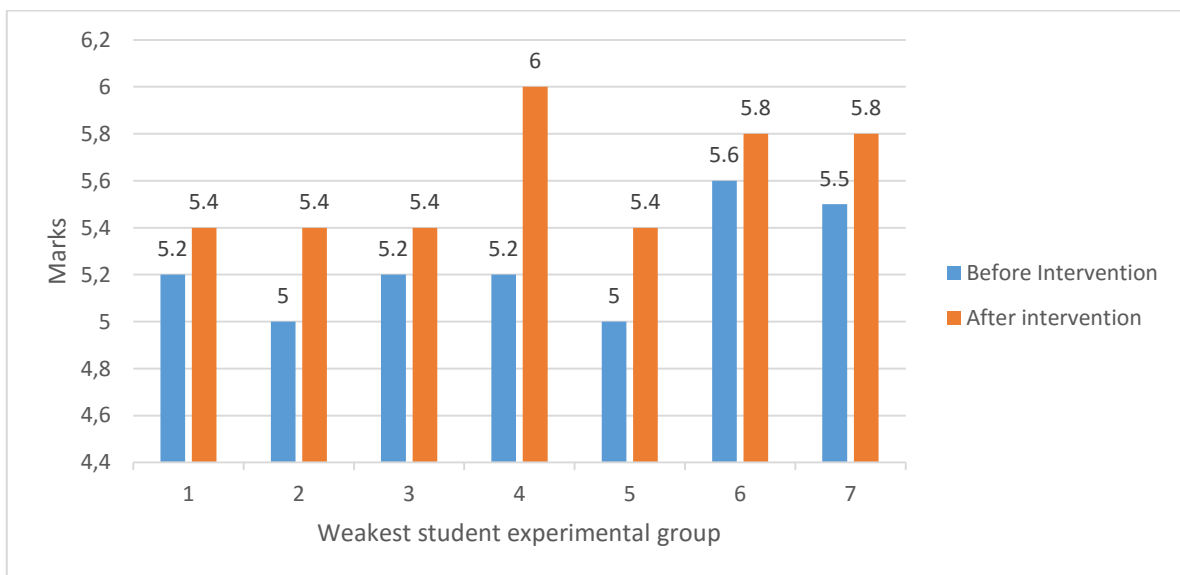


Chart 13. Weakest students in the experimental group

4.4 Results of the post-training evaluation questionnaire

The post training evaluation questionnaire was applied to find out the participants' opinions in relation to the relevance of the activities, the time allotted to the sessions, and extent of confidence they gained as a consequence of the intervention. The answers were quantified and the results can be found in the tables below. The questionnaire and more details about the answers to it can be found in appendix 3.

4.4.1 Overall impression of the sessions

According to table 1, 3 out of the 8 participants who responded coincided on the use of the kazoo as the most interesting or impressive element from the pedagogical intervention. The relationship between music and phonetics was another coincidence; 2 out of 8 students agreed on this.

Answers	Frequency	Total number of participants
Relationship between music and phonetics	2	8
The use of the kazoo	3	8
Other responses	3	8

Table 1. Frequency of responses to the statement: *What impressed me or interested me the most from the sessions*

4.4.2 Relevant activities

As can be seen in table 2, the activities that the participants found more relevant were the use of the kazoo and bouncing balls, which had 3 out of 8 preferences each. It is also

interesting that there were 2 participants who found all the activities relevant. Participants could select more than one activity in this part of the questionnaire.

Relevant activity	Frequency
Use of the kazoo	3
Bouncing balls	3
Montessori three-stage cards	2
Creating raps and melodies	1
Uttering a sentence in a specific tempo	1
All of them	2

Table 2 Frequency of responses to the statement: *The activities that were relevant...*

4.4.3 Irrelevant activities

As shown in table 3, six out of the eight students of this group responded that none of the activities was irrelevant.

3. Responses to the	Activity	Frequency	Total number of participants
	None	6	8
	Marching	1	8
	Repetition of some of them	1	8

statement: *The activities that were not relevant...*

4.4.4 Extent of confidence gained through the intervention

It can be seen from table 4, that the students gained confidence in identification, differentiation, and realization of pitch accents; although the highest degree of confidence was obtained in the differentiation of nuclear and prenuclear accents, where the average was 4.3 and the maximum score was 5.

Score				
Statement				Average
Identification of pitch accents				3.8
Differentiation of nuclear and pre-nuclear accents				4.3
Realization of pitch accents				3.9
Not at all	Not well	Neutral	Well	Very well
1	2	3	4	5

Table 5. To what extent did you gain confidence in the following

4.4.5 Time allotted to the training

Table 6 shows the level of satisfaction that students had in relation to the time allotted for the pedagogical intervention. 7 out of the 8 students who answered this questionnaire agreed that the time was not enough.

Answer	Frequency	Total number of participants
Not enough	7	8
Enough	1	8
Too much	0	8

Table 6. Time allotted to the training

4.5 Discussion of the results

In this section a brief discussion of the results obtained from the different instruments will be presented. For the sake of clarity, this discussion will follow the order in which the results were presented.

4.5.1 Results of post-tests 1 and 2

Strong evidence of an improvement in accentuation skills of the experimental group is supported by the data. The different analysis demonstrated that the results obtained by the experimental group under the application of the musical method have revealed significant effects in comparison to those obtained with the traditional method in the control group.

The results of the post-tests 1 and 2 show a significant increase for the experimental group in comparison with the control group. Moreover, this increase is higher for post-test 1, which was considered more demanding than post-test 2, since the accents were not marked. Nevertheless, due to the small size of the sample, it would be very simplistic to claim that these results were caused only by the intervention with the musical training method. In fact, there are other factors which could have influenced the participants' performance in the tests, such as additional preparation outside the pedagogical intervention and individual effort, which were not accounted for.

4.5.2 Results according to the participants' musical aptitude

Regarding the benefit in relation to the musical aptitude of the participants, the results of the post-tests suggest, although not conclusively, that musical training was beneficial to all the participants. The most interesting finding is perhaps the fact that 2 out of the 3 participants with low musical aptitude obtained perfect scores in the most demanding test (post-test 1) and they all obtained perfect scores in post-test 2; this evidence leads me to hypothesize that the participants that were more benefited by the musical training were those with low musical aptitude.

4.5.3 Attainment of control and experimental groups in oral production before and after the pedagogical intervention in the intonation course

Regarding the intonation workshop mark averages, the findings clearly indicate that the experimental group was more benefited by the musical method than the control group by the traditional method. The mark average results indicate a marked increase by 0.3 points after the pedagogical intervention, which compared to the 0.04 points of the control group, is significant. In addition, there was a considerable upward trend for the experimental group in the comparison of the weak students' attainment in oral production before and after the period of instruction, i.e. all weak students from this group increased their average oral production mark in at least 0.2 and there was one participant who obtained an average 0.8 higher after the intervention. At this point I can hypothesize that, since the participants from the experimental group attended the traditional training sessions as well, the musical training could have complemented the traditional training for the experimental group; however, these more significant results could also be the consequence of personal motivation to study or extra practice outside the pedagogical intervention sessions.

4.5.4 Results of the post-training evaluation questionnaire

The findings clearly indicate that the participants were impressed by the relationship between music and language and the use of the kazoo. Similarly, the activities the participants found more relevant were those that included the use of this instrument. In addition, 3 participants selected an activity called bouncing balls, which was related to intonation (see section 3.4.2). Regarding the extent of confidence gained after the sessions, the participants reported to have gained confidence in identification, differentiation, and realization of pitch accents but they gained the highest confidence in differentiation of prenuclear and nuclear accents; an average of 4.3 out of 5. In conclusion, they found the intervention relevant to their learning because it made them gain confidence in specific competences related to pitch movement and accentuation. Finally, another detail that deserves special notice is that most participants, 6 out of 8, thought the time allotted to the sessions was insufficient. This suggests, although not conclusively, that they would have liked to have more sessions.

The inescapable conclusion which emerges from what I have said in this subsection is that the musical method had a significant effect in comparison with the traditional method and it was beneficial to the participants. Nevertheless, the small size of the sample makes one doubt that this desired effect was caused only by the intervention itself, or there were other factors, such as motivation or additional practice outside the sessions involved. The main conclusion to be drawn is that although the results are significant, further research including a larger sample size is needed in order to verify the validity of this study.

CHAPTER 5: CONCLUSIONS

5.0 Introduction

The current chapter concludes the dissertation by summarizing the findings presented in Chapter 4, as well as providing a conclusion of the whole research process. Firstly, I will recap the main findings concerning the results. Secondly, I will refer to the limitations of the study and finally, I will provide some directions for further research.

5.1 Findings

The purpose of the present research was to find out whether the use of musical training could be beneficial to TEFL students' learning of some of the prosodic features that they are expected to operate. As a final interpretation it can be said that the different analysis demonstrated that the results obtained by the experimental group under the application of the musical method have revealed significant effects in comparison to those obtained with the traditional method in the control group. The participants who took part in the pedagogical intervention, i.e. the experimental group, had more significant results than the control group in the post-test that measured location of post lexical accents. This post-test was considered the most demanding of the two post-tests because it did not have marked accents, i.e. the participants had to decide where to place the accents. Additionally, the results of the post-test 2, which consisted of the participants' oral interpretation of tones, were also more significant in comparison to the control group. In conclusion, the pedagogical intervention with the musical method had the desired effect; it benefited the participants in their choice of placement and realization of prenuclear and nuclear accents. The point for concern here is, if this desired effect was caused only by the pedagogical intervention or this acted as a complement to the traditional method. I am more inclined to believe that it was a complement.

On the other hand, the analysis provided information in relation to the attainment in oral production after the intervention, and the improvement of the experimental group was far more significant than that of the control group. In summary, all students who participated in the pedagogical intervention improved their oral production.

In addition, the opinions of the participants regarding the activities and sessions of the pedagogical intervention were positive; most of the participants found the activities relevant and the sessions helpful. In fact, they said it made them gain confidence in differentiation, identification, and realization of pitch accents.

5.1 Limitations of the study

As a direct consequence of the methodology used, the study encountered a number of limitations, which need to be considered. First, the sample was too small. Although the results are significant, the size of the sample does not allow generalization. This was mainly due to the situation UMCE was going through at the time of the research; the students were on strike and as a consequence the academic term was shortened. Therefore, when the students resumed their academic activities they had very little extra time and were not willing to participate in the research. Second, neither the skills nor the marks of the selected participants could be considered. This was also a consequence of the previously mentioned strike. It would have been ideal to have a more varied sample of participants with low, medium, and high marks in oral production. Finally, another limitation to be considered was a group of variables which could not be controlled, such as the hours of autonomous study, attendance, and motivation to study. These variables might have influenced the performance of some of the participants but there was no way to control any of them.

5.2 Directions for further research

An important task for future research will first be to replicate this study but this time, with a larger sample and, as suggested by the participants in the post-training evaluation questionnaire, for a longer period of time. Another very promising application would be to try different scenarios, such as year 1 TEFL students, or school students; in order to find out what the results are with learners who have no prior training and theoretical knowledge on the topic. On the other hand, it also seems necessary to do some methodological research to continue developing the musical method, considering the activities that were more relevant for the participants in this research, and adding others. Finally, it seems advisable to introduce this method as it was used, i.e. as a complement to

the intonation workshop for TEFL students, since I personally believe that theoretical knowledge is needed in order to understand and learn how sentence accentuation works.

REFERENCES

- Anvari, S.H., L.J. Trainor, J. Woodside & B.A. Levy. 2002. Relations among musical skills, phonological processing, and early reading ability in preschool children. *Journal of Experimental Child Psychology*, 83, 111-130.
- Arellano, S.I. & J.E. Draper. 1972. Relations between musical aptitude and second language learning. *Hispania*, 55(1) 111-121.
- Besson, M. & D. Schon. 2001. Comparison between language and music. *Annals of the New York Academy of Sciences*, 930, 232–259.
- Brown, S., M.J. Martinez & L.M. Parsons. 2006. Music and language side by side in the brain: a PET study of the generation of melodies and sentences. *European Journal of Neuroscience*, 23, 2791-2803.
- Cruttenden, A. 1997. *Intonation*. Cambridge: Cambridge University Press.
- Dankovicová, J., J. House, A. Crooks, K. Jones. 2007. The relationship between musical skills, music training and intonation analysis skills. *Language and Speech*, 50(2) 177-225.
- Elbert, T., C. Pantev, C. Wienbruch, B. Rockstroh & E. Taub. 1995. Increased cortical representation of the fingers of the left hand in string players. *Science*, 13, 305-307.
- Fonseca-Mora, C. 2000. Foreign language acquisition and melody singing. *English Language Teaching Journal*, 54: 147.
- Gilbert, J. 2011, June 23. Teaching pronunciation: seven essential concepts with Judy B. Gilbert [Video file]. Retrieved from <http://www.youtube.com/watch?v=BPmjGHdK5v8>
- Gussenhoven, C. 1983a. Focus, mode and the nucleus. *Journal of Linguistics* 19, 377–417. Reprinted in Gussenhoven (1984).

- Jaramillo, M., T. Ilvonen, T. Kujala, P. Alku, M. Tervaniemi & K. Alho. 2001. Are different kinds of acoustic features processed differently for speech and non-speech sounds? *Cognitive brain research*, 12, 459-466.
- Kingdon, R. 1958. *The groundwork of English stress*. London: Longmans, Green.
- Koelsch, S., E. Kasper, D. Sammler, K. Schulze, T. Gunter, & A. D. Friederici. 2004. Music, language and meaning: brain signatures of semantic processing. *Nature Neuroscience*, 7(3), 302-307.
- Ladd, R. 2008. *Intonational Phonology*. Cambridge: Cambridge University Press.
- Mackenzie Beck, J. 2003. Is it possible to predict students' ability to develop skills in practical phonetics? In *Proceedings of the 15th International Congress of Phonetic Sciences*, Barcelona, 2833-2836.
- Maess, B., S. Koelsch, T.C. Gunter & A.D. Friederici. 2001. "Musical syntax" is processed in the area of Broca: An MEG-study. *Nature Neuroscience*, 4, 540-545.
- Marin, O.S.M. & D.W. Perry. 1999. Neurological aspects of music perception and performance. In D. Deutsch, (Ed.). *The psychology of music*, 2nd edition. San Diego, CA: Academic Press, 653-742.
- Milovanov, R., M. Huotilainen, V. Välimäki, P.A.A. Esquef & M. Tervaniemi. 2008. Musical aptitude and second language pronunciation skills in school-aged children: neural and behavioral evidence. *Brain Research*, 1194, 81-89.
- Martenot, M. 1957 *Metodo Martenot. Solfeo, Formacion y Desarrollo Musical*. Ricordi Americana: Buenos Aires
- Näätänen, R. 2001. The perception of speech sounds by the human brain as reflected by the mismatch negativity (MMN) and its magnetic equivalent (MMNm) *Psychophysiology*, Cambridge University Press. 1-21.

- Näätänen, R., T. Jacobsen & I. Winkler. 2005. Memory based or afferent processes in mismatch negativity (MMN): A review of the evidence. *Psychophysiology*, 42, 25-32.
- Näätänen, R., M. Tervaniemi, E. Sussman, P. Paavilainen & I. Winkler. 2001. Primitive intelligence in the auditory cortex. *Trends in Neurosciences*, 24(5), 283-288.
- Ortiz, H. 1995. Nucleus placement in English and Spanish: a pilot study of patterns of interference. In J. Windsor Lewis (ed.) *Studies in general and English phonetics. Essays in honour of Professor J. D. O'Connor*. London: Routledge. Pp. 255-265.
- Pantev, C., R. Oostenveld, A. Engelien, B. Ross, L. Roberts & M. Hoke. 1998. Increased auditory cortical representation in musicians. *Nature*, 392, 811-814.
- Patel, A. D. 2011. Why would musical training benefit the neural encoding of speech? The OPERA hypothesis. *Frontiers in Psychology*, 2, 142.
- Peretz, I. 2002. Brain specialization for music. *Neuroscientist*, 8(4), 374-382.
- Peretz, I. 2006. The nature of music from a biological perspective. *Cognition*, 100, 1-32.
- Slevc, L. R., & A. Miyake. 2006. Individual differences in second language proficiency: does musical ability matter? *Psychological Science*, 17, 675-681.
- Tervaniemi, M., M. Rytkönen, E. Schröger, R.J. Ilmoniemi & R. Näätänen. 2001. Superior formation of cortical memory traces for melodic patterns in musicians. *Learning & Memory*, 8, 295-300.
- Vigneau, M., V. Beaucousin, P.Y. Hervé, H. Duffau, F. Crivello, O. Houdé, B. Mazoyer & N. Tzourio-Mazoyer. 2006. Meta-analyzing left hemisphere language areas: phonology, semantics, and sentence processing. *NeuroImage*, 30, 1414-1432.
- Vohringer, E. & O. Vejar. 2004. Prueba de aptitudes musicales rítmica y melódica UMCE
- Wells, J. 2006. *English Intonation. An Introduction*. Cambridge: Cambridge University Press.

- Zatorre, R.J. & I. Peretz. 2001. The biological foundations of music education. New York: *Annals of the New York Academy of Sciences*, 930, 232-258.
- Zatorre, R.J., P. Belin & V.B. Penhune. 2002. Structure and function of auditory cortex: music and speech. *Trends in Cognitive Science*, 6, 37-46.
- Zhao, X., Mauer, M.V., & Doyle-Smith, N. C. 2012. A general music background questionnaire based on Google Forms and Google Template. Talk presented at the 42nd annual meeting of the Society for Computers in Psychology, Minneapolis, November, 2012.

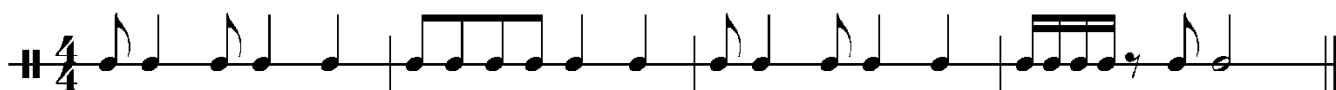
APPENDIX A: MUSICAL APTITUDE TEST

Prueba de aptitudes Musicales rítmica y melódica

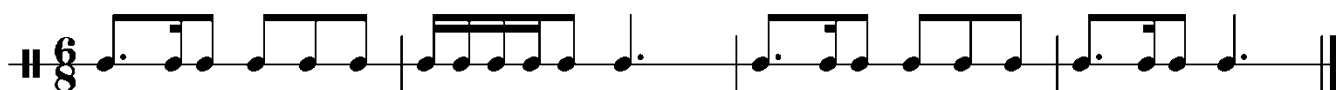
Elaborada por los académicos E. Vohringer y O. Vejar

Rítmica:

Compás simple:



Compás compuesto:



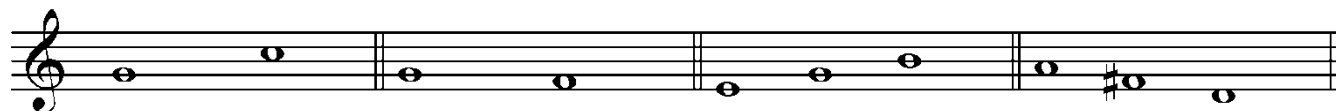
Melódica:

I Escalas



II Intervalos

Arpeggios



III Frases melódicas con acompañamiento

a)



b)



IV A capella

a)



b)



V Completación

a)

D G D A7 D

Exercise a) is a musical phrase in G major, 2/4 time, consisting of 8 measures. The notes are: G4 (quarter), A4 (quarter), B4 (quarter), A4-G4 (beamed eighth notes), F#4 (half), E4 (half), D4 (half), and D4 (half). The chord sequence is D (measures 1-2), G (measures 3-4), D (measures 5-6), A7 (measures 7-8), and D (measures 9-10).

b)

D G D A7 D

Exercise b) is a musical phrase in G major, 2/4 time, consisting of 8 measures. The notes are: G4 (quarter), A4 (quarter), B4 (quarter), A4-G4 (beamed eighth notes), F#4 (half), E4 (half), D4 (half), and D4 (half). The chord sequence is D (measures 1-2), G (measures 3-4), D (measures 5-6), A7 (measures 7-8), and D (measures 9-10).

c)

D A7 D D D

Exercise c) is a musical phrase in G major, 2/4 time, consisting of 8 measures. The notes are: G4 (quarter), A4 (quarter), B4 (quarter), A4-G4 (beamed eighth notes), F#4 (half), E4 (half), D4 (half), and D4 (half). The chord sequence is D (measures 1-2), A7 (measures 3-4), D (measures 5-6), D (measures 7-8), and D (measures 9-10).

APPENDIX B: QUESTIONNAIRE

Post-training evaluation questionnaire

Instructions: Please give your answers or comments in writing and indicate the extent to which you gained confidence in the topics you learnt on a scale of 1 to 5.

1. Overall evaluation						
1.1	What impressed me or interested me most was ... (please explain why)					
1.2	What facilitated my learning was ...					
1.3	The activities that were relevant to me were ...					
1.4	The activities that were not relevant or did not help were...					
1.6	The time allotted to the training was...					
2. To what extent did you gain confidence in the following?						
		Not at all	Not well	Neutral	Well	Very well
2.1.1	Identification of pitch accents	1	2	3	4	5
2.1.2	Differentiation of nuclear and pre-nuclear accents	1	2	3	4	5
2.1.3	Realization of pitch accents	1	2	3	4	5
2.1.4	How can I improve this module?					

Additional comments

.....

.....

.....

.....

APPENDIX C: LESSON PLAN 1

UNIVERSIDAD METROPOLITANA DE CIENCIAS DE LA EDUCACION
DEPARTAMENTO DE INGLES – METHODOLOGY

TEACHER: _____ Anita Aguilera _____

CLASSROOM N°: ____6__ TIME: _12:00_____

DATE OF CLASS: ____4/12/15____ TEACHING SESSION N°: ____1__

LESSON PLAN N° 1____

PERFORMANCE OBJECTIVE(S)	CONTENTS RELATED TO PERFORMANCE OBJECTIVE	INSTRUCTIONAL STRATEGIES	MATERIAL TO BE USED WITH THE INSTRUCTIONAL STRATEGIES	EVALUATION	SUGG . TIME FOR P.O.
Objective 1: to develop the rhythmic sense. Objective 2: to relate rhythmic patterns to language phrases	Relating sentence accent to rhythmic patterns	<p>Warm up</p> <p>Teacher greets student asks them how they are and if they have any questions about the intervention</p> <p>Act 1: rhythmic patterns</p> <p>The teacher produces a rhythmic pattern using syllable <i>-la</i>, which participants repeat. Then, they memorize the mentioned pattern and repeat it when the teacher indicates.</p> <p>Act 2: expressive formulas</p> <p>This activity consists on changing the pitch pattern while keeping the same rhythmic pattern. The pitch patterns used involve, for instance,</p>	Computer, speakers and data	<p>Evaluation</p> <p>In pairs, participants make up other phrases or sentences that have the same prenuclear and nuclear accents as those in the last activity and they take turns to lead the group.</p>	<p>5 min</p> <p>10 min.</p> <p>10 min</p>

		<p>differences between affirmative versus interrogative forms and attitudinal features such as excitement, astonishment, sadness, etc.</p> <p>Act 3: marches Participants stand in a circle. The teacher produces a rhythmic pattern and starts to march saying the mentioned pattern while marking the beat by stamping her feet. Students follow the teacher. Then, they march while keeping the rhythm and clapping the rhythmic pattern. Finally, they repeat the activity but this time instead of clapping the rhythmic pattern they tap their right index on their left palm</p> <p>Act 4: memorization of rhythmic patterns related to language phrases</p> <p>While marching,</p>			<p>12 min</p> <p>5 min</p>
--	--	--	--	--	--

		<p>participants say phrases such as: <i>What are you doing?</i>, <i>Good afternoon</i>, <i>It's getting late</i>, as if they were part of a song. They march and show the nuclear accent with bodily movements assigned by the teacher, e.g. they lift their arms when the nuclear accent is produced or they raise a fist.</p> <p>Act 5: evaluation (described in the evaluation section)</p> <p>Closure: teacher asks students their opinion about the session.</p>			<p>12 min</p> <p>6 min</p>
--	--	---	--	--	--

AUTHORIZATION FOR REPRODUCTION

2016, Aguilera Beltrán Ana Luisa

Total or partial reproduction of this material, for academic purpose, by whatever means is authorized, provided the bibliographic reference attesting this work and its author is made

DEDICATION

I would like to dedicate this work to my parents, my mother Iris and my father Luis, for their unconditional support and for having instilled in me the desire to learn.

ACNOWLEDGEMENTS

This dissertation could not have been produced without the invaluable help of family, principally my son, Cristián and my parents. My son was always willing to help me with his immense scientific knowledge and my parents were eager to listen to my ideas and encouraged me to follow my beliefs. I also want to thank my supervisor, Hector Ortiz for his comments and criticism, my colleague Pablo Corvalán, for being so helpful and supportive, and the teacher Daniel Miranda for his help with the musical aptitude test and ideas for the research. Finally, my indebtedness to my friends, Helen Grover who supported me and helped me by proof reading and Adrian Olea who helped me with statistics, charts and tables and also supported me. Without them, I would not have reached this stage.

Ana Luisa Aguilera Beltran

ABSTRACT

ABSTRACT

The present study examines the effectiveness of a musical method to train location and realization of post-lexical accentuation. There is lack of empirical evidence regarding the connection between music and the suprasegmental features of the English language. This research seeks to contribute to evidence in current pedagogical practice in relation to the topic. To do this, a quasi-experimental study was carried out. Two groups of year 3 TEFL students from UMCE were compared: One of them, the experimental group, had a pedagogical intervention using musical training. The other group had no musical training whatsoever. Both groups continued having the traditional training provided at the university. The different analysis of the results obtained by the experimental group under the application of the pedagogical intervention, revealed significant effects in comparison to those obtained with the traditional method in the control group.

KEYWORDS: musical training, post-lexical accentuation, location, realization.

RESUMEN

El presente estudio examina la efectividad de un método musical para el entrenamiento en localización y producción de acentuación post léxica. Existe una gran falta de evidencia empírica en cuanto a la conexión entre la música y las características suprasegmentales del idioma inglés. Esta investigación busca contribuir con evidencia relacionada con el tema en la práctica pedagógica. Para hacer esto un estudio cuasi-experimental fue llevado a cabo. Dos grupos de alumnos de 3er año de pedagogía en inglés de UMCE fueron comparados. Uno de los grupos, el grupo experimental, tuvo una intervención pedagógica usando un método musical. El otro grupo no tuvo ningún tipo de entrenamiento musical. Ambos grupos continuaron con el entrenamiento tradicional otorgado en la universidad. Los distintos análisis demostraron que los resultados obtenidos por el grupo experimental bajo la intervención pedagógica revelaron efectos significativos en comparación a aquellos obtenidos por el grupo control con el método tradicional.

PALABRAS CLAVE: entrenamiento musical, acentuación post léxica, localización, producción.

TABLE OF CONTENTS

CHAPTER 1: INTRODUCTION.....	1
1.0 Preliminary remarks.....	1
1.1 Statement of the problem.....	2
1.3 Research questions.....	3
1.3.1 Main questions.....	3
1.3.2 Subsidiary questions.....	3
1.4 Objectives	3
1.4.1 General objectives.....	4
CHAPTER 2: THEORETICAL FRAMEWORK.....	5
2.0 Introduction	5
2.1 Phonological framework.....	5
2.1.1 Prosody.....	5
2.1.2 The marking system.....	7
2.1.3 Pitch accents	7
2.1.4 Focus	8
2.1.5 Broad focus and narrow focus.....	10
2.1.6 Exceptions to the LLI rule	10
2.1.6.1 Event sentences.....	11
2.1.6.2 Wh questions ending in a verb.....	11
2.1.6.3 Final relative clauses.....	11
2.1.6.4 Nouns+adjectives and participles	12
2.1.6.5 Transitive verb+object+adverbial particle.....	12
1.1.7 Narrow focus	12
1.1.8 Nuclear accent and nuclear tone	13
2.2 Musical framework: introduction.....	15
2.2.1 Music and language.....	15

2.2.2 The musical method.....	16
2.2.3 Research on neuroscience.....	18
2.2.4 Musical aptitude and neurolinguistics.....	20
CHAPTER 3: METHODOLOGY.....	21
3.1 Description of the study.....	22
3.2 Sampling	22
3.3 Instruments.....	23
3.3.1 Musical aptitude test	23
3.3.2 Post-tests	25
3.3.3 Post-training evaluation questionnaire.....	27
3.4 The pedagogical intervention.....	27
3.4.1 the procedures applied in the experimental group.....	27
3.4.2 Activities the students found more relevant	28
3.5 Data analysis procedures.....	29
CHAPTER 4: RESULTS AND DISCUSSION	31
4.0 Results.....	31
4.1 Post-tests results.....	31
4.1.1 Results of post-test 1	32
4.1.2 Results of post-test 2	34
4.2 Correlation between the post-tests results and musical aptitude.....	35
4.2.1 Individual results of the experimental group for post-test 1.....	35
4.2.2 Individual results of the experimental group for post-test 2.....	36
4.3 Attainment of control and experimental groups before and after the P. I.....	37
4.3.1 Comparison of oral production average marks of the control and experimental groups.....	38
4.3.2 Attainment of the weakest participants of the control and experimental groups in the intonation workshop.....	39
4.4 Results of the post-training evaluation questionnaire.....	41
4.4.1 Overall impression of the sessions.....	41

4.4.2 Relevant activities	41
4.4.3 Irrelevant activities.....	43
4.4.4 Extent of confidence gained through the intervention	44
4.4.5 Time allotted to the training	44
4.5 Discussion of the results	45
4.5.1 Results of post-tests 1 and 2	45
4.5.2 Results according to the participants' musical aptitude	45
4.5.3 Attainment of control and experimental groups in oral production ...	46
4.5.4 Results of the post training evaluation questionnaire.....	46
CHAPTER 5: CONCLUSSIONS	48
5.0 Introduction	48
5.1 Findings	48
5.2 Limitations of the study.....	49
5.3 Directions for further research.....	49
REFERENCES	51
APPENDIX A	55
APPENDIX B.....	56
APPENDIX C.....	59

CHAPTER 1: INTRODUCTION

1.0 Preliminary remarks

During my years of experience as an EFL teacher, I have noticed that learners who have a “good ear”, understood as a high musical aptitude, have outstanding pronunciation skills and show a certain ability to reproduce intonation patterns. There is a fair amount of evidence regarding the relationship between musical aptitude and a good pronunciation of segments, e.g. Mackenzie (2003) and Milovanov et al. (2008). Unfortunately, concrete evidence on a similar relationship involving prosody and its possible correlation with musical aptitude is not so abundant. Furthermore, in a research on the relationship between musical skills, music training, and intonation analysis skills, Dankoviková et al. (2007) state that musical training as part of phonetic training could enhance the students’ ability for intonation. In order to fulfil that need, it is my role as an EFL teacher to investigate this particular aspect of teaching.

As a teacher at Universidad Metropolitana de Ciencias de la Educación (UMCE), I have observed that there are a considerable number of students with outstanding musical abilities; there are several musicians, singers, and students who started to like English simply because their favourite singers sang in English. At UMCE, students go through a six-semester phonetics course, which makes it the ideal place to do research on intonation acquisition. Moreover, a serious lack of location and realization of post-lexical accentuation placement has been reported. As part of their training, students are expected to handle the so-called ‘tonetic-stress marking system’ (Kingdon, 1958), that is based on the principle that a mark is placed before a syllable indicating stress by its presence and tone by its form. According to Ortiz (personal communication) most students are able to correctly mark accents in a text after going through training but when they are asked to read the same text and interpret the marked accents they fail to produce them accurately. Generally, they fail to associate the correct pitch direction and pitch range with the form of the mark, or associate the presence of the syllable bearing the tone mark with some type of pitch movement. These students would therefore benefit from additional training for pitch

accent realization. The study which I propose here aims to investigate whether implementing a musical method will be beneficial to TEFL students' acquisition of some of the essential prosodic features that they are expected to operate.

1.1 Statement of the problem

The acquisition of intonation in EFL is a particularly difficult task. It requires the learner to know which words to highlight, when the pitch of the voice rises and falls, and how to use this variation to convey pragmatic meaning. Proper handling of prosodic features (e.g. pause, pitch, and loudness) can help deliver the intended message appropriately.

On the other hand, a crucial factor to convey meaning involves the last accent in an intonational phrase; the incorrect placement of nuclear accents can render a totally different idea (as in, for instance, *Why don't you EAT children?* and *Why don't you eat CHILdren?*). In addition, there are many differences in the way Spanish and English assign the location of this accent (as in, for instance, *I forGOT to LET the DOG outside*, which in Spanish would be *olviDE deJAR el PERro aFUERa*). Wells (2006) states that learners generally transfer the prosodic features of their mother tongue to a second or foreign language; therefore, in this case a Spanish speaker of English would place the nuclear accent on the last word in the intonational phrase (*outSIDE*). In addition, Wells points out that when the prosodic features of the mother tongue are transferred to the foreign language the result is a foreign accent. In order to avoid this, learners who aim at near native performance must get acquainted with the phonetic and phonological aspects of prosody.

Wells (2006) states that if learners study pronunciation at all, they usually concentrate on segmental phonetics but not on intonation. This is mainly because the teacher fails to teach intonation and the learners fail to learn it. Fortunately, at UMCE, TEFL students must go through a thorough study of segmental and prosodic phonetics and phonology throughout the curriculum; therefore, it is a suitable place to do research on the acquisition of intonation and discover if using a musical method to teach prosody is beneficial to students.

1.2 Hypothesis

It is hypothesized that TEFL students who are given explicit musical training with a method similar to that postulated by Martenot will improve their oral production skills through the location and realization of prenuclear and nuclear accents.

1.3 Research questions

The research questions were divided into main questions and subsidiary questions.

1.3.1 Main questions

- Is musical training with a method similar to that postulated by Martenot more effective than the traditional training being used at UMCE?
- Has the musical training method been beneficial to students' location of post lexical items?
- Has the musical training method been beneficial to students' oral interpretation of tone?

1.3.2 Subsidiary questions

- Which activities of this musical method do students find more useful?
- Are students with high musical aptitude more benefited from the use of a musical method than the students with medium or low musical aptitude?
- What are the results obtained by students with low musical aptitude when exposed to a musical method?

1.4 Objectives

1.4.1 General objective

The aim of this study is to investigate whether using a musical method to train TEFL students to place and realize pitch accents appropriately benefits students' English accentuation.

1.4.2 Specific objectives

The above aim entails the following specific goals:

To observe the correlation of the marks of weakest students of the experimental and control groups in the intonation workshop before and after the intervention.

To identify the activities which contributed the most to improving students' performance.

To detect differences among the results obtained from the weakest students of both groups under the different kinds of instruction.

To detect differences among the results obtained from the students with high, middle and low musical aptitude in the experimental group.

CHAPTER 2: THEORETICAL FRAMEWORK

2.0 Introduction

This chapter is divided into two sections. In 2.1, prosodic features such as intonation and accentuation are discussed, including, pitch accent, focus and tone. In 2.2, the relationship between language and music is described, together with the musical method, musical aptitude, and a review of neuroscience research. The main purpose of this chapter is to set the base for the research and to clarify what views and approaches this study will be based on.

2.1 Phonological framework

The phonological framework section consists of five different subsections. In the first subsection, I will provide definitions of intonation by different authors, mentioning the difficulties that non-native speakers undergo when learning a foreign language and the need to have a native-like intonation. In the second subsection, I will describe the marking system that will be used throughout this dissertation. Pitch accents will be dealt with in the third subsection, to continue in the following subsection with the notion of focus and its different types, presenting the contributions to the theory and views of the most influential authors in the field. Finally, I will explore the concepts of nuclear accent and nuclear tone.

2.1.1 Prosody

Speech varies in terms of four auditory features: pitch movement (i.e. falling and/or rising), loudness (i.e. loud and/or soft), quality (i.e. strong and/or weak), and duration (i.e.

long and/or short), which in turn are responsible for mainly five types of prosodic features: accentuation, intonation, rhythm, tempo, and pause.

Prosody is present in connected speech all the time. People speak more quietly if they do not want to be heard and speak louder if they want to emphasize. Speakers speed up when they are impatient or excited and slow down when they are sad or depressed. All intonation languages (such as English and Spanish) make use of the elements of one of the prosodies: intonation. Wells (2006: 1) defines intonation as ‘the melody of speech’, i.e. ‘the pitch of the voice rises and falls’, and explains ‘how speakers use this pitch variation to convey pragmatic meaning’. A more phonological definition is provided by Ladd (2008: 4): “the use of suprasegmental phonetic features to convey ‘postlexical’ or sentence-level pragmatic meaning in a linguistically structured way”. In addition, a view that is shared by various authors in England and was proposed by Halliday (1967) is that intonation entails the interaction of three subsystems – tonality, tonicity and tone. Tonality is the segmentation of discourse into a sequence of intonational phrases. Tonicity is the location of the most prominent word in each intonational phrase (IP), and tone is the contrastive movement of pitch on the tonic (or nuclear) syllable. This dissertation has to do with tonicity, i.e. nucleus placement.

Different languages have different prosodic characteristics; therefore, learning to speak a foreign language can be troublesome in this respect. By combining pitch levels and contours, speakers express a variety of intonational meanings, breaking the utterance into chunks, focusing on some parts of it indicating which part of the message is background information and which is foreground. Wells (2006) states that learners frequently tend to transfer the prosodic features of their mother tongue to a second or foreign language. When mother tongue prosodic features are transferred to the foreign language the result is a

foreign accent. According to Wells (2006), native speakers expect non-natives to make mistakes in the pronunciation of segments but not on prosody; moreover, he claims that English speakers assume that when it comes to intonation people mean what they say; this is why some native speakers may misinterpret the spoken message of a non-native speaker of English. In conclusion, it is of great importance for advanced speakers of English to acquire prosodic features of English.

2.1.2 The marking system

At this point, it becomes necessary to mention that the notation marking system used in this dissertation is mainly the ‘tonetic stress marking system’, recently referred to as ‘tonetic accent marking system’ by Cruttenden (2014). I will use the latter term so as to not mislead the reader into confusing sentence accent with word stress. I have chosen this system principally because of its simplicity and because it fulfils two functions: each mark shows accentuation, as well as the pitch movement associated with it. It is a broad type of intonational transcription since marks are given only to accented words, while prominent and non-prominent syllables are left unmarked, with the optional use of [°] to indicate rhythmic beats in the tail. In this and the next chapters I will be using the following types of pitch accents to represent nuclear tones: two falling [ː], [ˑ], and two rising: [˒], [˓]. For the sake of simplicity, all pre-nuclear accents will be marked with [ˑ].

2.1.3 Pitch accents

Since the main objective of this study is the realization of pitch accents, it is crucial to define them and then refer to the notion of nuclear accent and nuclear tones. Cruttenden (1997: 14) defines pitch accents as ‘syllables that are made prominent for linguistic

purposes’ and goes on to explain that ‘pitch accents depend on some sort of obtrusion of pitch at the point of accent from the pitch of surrounding syllables. Such obtrusions depend on movement to or from the accented syllable involving a step-up, a step-down, a movement down-from, or a movement up-from. Accents may involve a movement to or a movement from alone, or a combination of both types of obtrusion’ (Cruttenden 1997: 40). Another definition is provided by Ladd (2008: 48): “A pitch accent may be defined as the local feature of a pitch contour – usually but not invariably a pitch change, and often involving a local maximum or minimum – which signals that the syllable with which it is associated is prominent in its nature”. All of this indicates that pitch accents are the backbone of intonation.

2.1.4 Focus

When speakers engage in conversation they direct their hearer’s attention to the more meaningful portions of their message, i.e. they bring syllables, words, phrases, and even sentences into focus. The term focus was first used by Halliday (1967) when he used it as ‘points of information focus’, in reference to the way in which intonation relates to information structure in spoken language. Years later, Gussenhoven (2007) expressed that native speakers of English direct their listener’s attention to parts of the message by means of nucleus placement. Its location indicates the size of the focus constituent or focus domain; in other words, all the material in the IP which is in focus. Gussenhoven (1983) maintains that accents, both prenuclear and nuclear, are assigned not to words but to focus domains which are formed from three types of components: arguments (NPs), predicates (VPs) and conditions (AdvP), e.g. in John met Mary at the supermarket, all three components are likely to be accented if they form part of the focus domain; however,

accents on John and supermarket (and not on Mary) are also possible, which means that within the focus domain there are components that may not take an accent. He also stated that the size of the focus is expressed through de-accentuation of constituents after the focus; therefore, predicates are usually not accented when they are supporting a focused argument and the relation between the pitch accents and the focus is mediated through the predicate-argument structure of the sentence, e.g.

(2.1) My `tyres have been cut.

(2.2) Your `trousers are torn.

Additionally, Gussenhoven distinguished three different focus meanings: whether the information represents new information, or a correction of existing information; whether the information reflects a change in the world, or a change in the hearer's knowledge about the world, and whether the knowledge about the world is immediately or potentially relevant. In a similar vein, in his 'Focus-to-Accent' (FTA) approach, Gussenhoven (1983) distinguishes the pragmatic/semantic notion of focus, from the phonetic/phonological definition of accent and allows focus to apply to larger portions of utterances. In Ladd's terms 'the FTA approach accepts the premise of the highlighting view that the location of sentence stress is always in some sense meaningful, and eliminates the implications of the normal stress view that there is a fundamental difference of kind between normal stress and contrastive stress' (Ladd, 2008: 218). Thus, normal stress will be understood as broad focus and contrastive stress as narrow focus.

2.1.5 Broad focus and the LLI rule

Ladd (1980) states that when an utterance is in broad focus the whole of the IP is in focus, mainly because all the information in the IP is new. Closely related to the idea of broad focus is the last lexical Item rule (LLI). Halliday (1967) was the first author to categorize it. This rule proposes that the last lexical item in an utterance is the one that receives the nuclear accent, e.g.

(2.3) There's a 'question I 'don't under`stand.

In (2.3) the whole of the IP is in focus; therefore, the nucleus goes on the last lexical item.

There are two instances when the LLI rule does not apply. The first one being when the element is given, i.e. it has been already mentioned, and when it is contrastive.

The most important considerations will be the notions of narrow focus, which I will refer to later, and the exceptions to the LLI rule, due to the fact that the realization of the nuclear accents in those cases is problematic for TEFL students whose mother tongue is Spanish. According to Ortiz (personal communication) 'students seem to have problems particularly when the nucleus is advanced, because in Spanish, the tendency is to accent the last word'. Consequently, I will refer to some of these exceptions, considering the most troublesome cases, i.e. the exceptions that have broad-focus versions in Spanish and take the nuclear accent on the last lexical item.

2.1.6 Exceptions to the LLI rule

This section explores utterances in which the nuclear accent is placed before the last lexical item. Mainly, sentences made up of noun phrases acting as subjects and predicates,

as well as final items with low semantic weight, such as utterances with transitive verbs+object+adverbial particle.

2.1.6.1 Event sentences

Gussenhoven (1984: 42) defines event sentences as those referring to historical events, i.e. those in which “something was (is, will be, might have been, was not, etc.) an event”. Notice that in (2.4) and (2.5) the predicates are unaccented, e.g.

(2.4) Our `bus’s coming.

(2.5) Your `dog’s barking.

2.1.6.2 Wh-questions ending in a verb

In these type of questions, the nuclear accent goes on the noun that represents the object, e.g.

(2.6) How much `water do you drink?

(2.7) Whose `car did you borrow?

Spanish speakers would tend to place the nuclear accent on the verbs ‘drink’ and ‘borrow’.

2.1.6.3 Final Relative Clauses

In this type of clauses, the accent generally goes on the noun. Again, in this case, Spanish speakers would place the nuclear accent on the last word.

(2.8) What about that `woman you were going out with?

2.1.6.4 Nouns + adjectives and participles

In (2.9) and (2.10), the nuclear accent goes on the noun preceding the participle. Spanish speakers would tend to place the nuclear accents on the adjectives, i.e. ‘loose’ and “unlocked” respectively.

(2.9) You for'got to let the `dog loose.

(2.10) You left the `door unlocked.

The Spanish versions of the sentences above have the nuclear accent on the last lexical item.

(2.11) Olvi'daste dejar el perro `suelto.

(2.12) De'jaste la `puerta sin `cerrar.

2.1.6.5 Transitive verbs+object+adverbial particle

This type of construction consists of a transitive verb followed by a direct object and an adverbial particle. In connected speech, the accents regularly go on the verb and the nominalized direct object as in (2.13), and on the verb and the particle if the object is pronominalized as in (2.14).

(2.13) She 'must have 'turned her `mobile off.

(2.14) 'Pick it 'up and 'throw it a way.

2.1.7 Narrow focus

The term ‘narrow focus’ was proposed by Ladd (1980) but the notion was already known under the name of ‘marked tonicity’ (Halliday, 1967). When an IP is in narrow focus only a portion of the information provided in the utterance is new and therefore in focus. Cruttenden (1997) points out that narrow focus works in a very similar way to broad

focus except that for several reasons some portion of the IP is considered to be out of focus (for instance, because it has been mentioned in the preceding IP). That part of the IP which is in focus will, like broad focus, take the nuclear accent on the LLI, e.g.

(2.15) A: 'What has `Santa brought you?

B: He's brought me a `doll.

In (2.15) only 'a doll' is new information, the rest, is given, therefore, the focus in the following IP is narrowed down to a single word 'doll'.

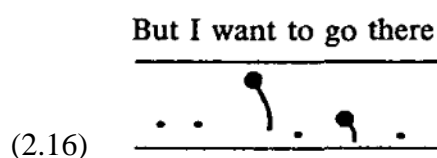
2.1.6 Nuclear accent and nuclear tone

As the term 'pitch accent' has already been defined, it is now necessary to refer to the types of pitch accents, i.e. nuclear and pre-nuclear accents. It is also relevant to refer to what will be understood by nuclear tone. I will explain this in the latter part of this subsection.

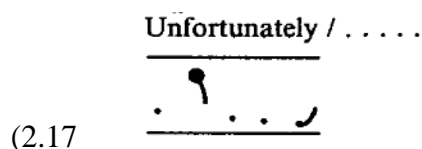
The term nuclear accent has received multiple names, ranging from "tonic syllable" Halliday (1967) to 'sentence stress' Ladd (2008). In this study I will use 'nuclear accent' to differentiate it from the term 'word stress', which refers to the 'potential for accent' (Cruttenden, 1997: 14). In order to define 'nuclear accent' I will consider two definitions which, in my opinion, have different perspectives. Firstly, Cruttenden (1997: 42) states that nuclear accent is 'the pitch accent which stands out as the most prominent in an intonation-group'. Later, in more functional terms, he defines it as 'the end of the new information' (Cruttenden, 2014: 286). Secondly, I will consider a phonological view proposed by Gussenhoven, who defines it as 'chief means of signalling the focus marking'

(Gussenhoven, 1984: 22). This means that the nuclear accent is a way in which speakers draw their listeners' attention to the focus of information in an utterance.

Pre-nuclear accents are those that occur before the nuclear accent. Nevertheless, there are cases in which the last accent, the nuclear accent, can be downgraded and a previous pitch accent (pre-nuclear) can be more prominent. Cruttenden (1997: 42) mentions two cases which are the most common ones. I refer to them because these cases received special attention in the study. The first one occurs when a movement down-from with a very wide glide is followed by another movement down-from but with a narrower glide, e.g.



In this case the first fall is likely to be heard as more prominent than the second. The second type of sequence to be considered occurs when there is an accent down-from followed by an accent up-from (called either a fall-rise, or a fall plus rise in British contour analysis), e.g.



A rise in pitch occurs in -ly which is an unstressed syllable in the word and not potentially accented. The syllable -ly is not taken as accented but as a mere part of the realization of the tune following the accent on -fort.

One of the main problems to be dealt with in this study is that TEFL students who are Spanish speakers tend to place the nuclear accent on the last words of sentences; this can be considered the default pattern. As Ortiz (1995:2) states ‘in Spanish the nuclear accent tends to fall on the last content word not only of constituents and sentences in broad focus, but also very often of sentences which are in narrow focus’; it is extremely difficult for Spanish speakers to realize nuclear accents appropriately when there are exceptions to the LLI rule and in sentences in narrow focus when the nucleus is advanced. These kind of sentences received special emphasis during the pedagogical intervention sessions and were included to be assessed in the post-tests.

Closely related to the notion of nuclear accent is that of nuclear tone. The British school of prosody defines nuclear tone as ‘the pitch movement which begins on the nuclear syllable and is completed either on that same syllable if there is no tail, or on the following syllables if there is a tail’ and, according to Cruttenden (1997: 50) ‘involves the major part of the meaning contributed by the pitch pattern of an intonation group’.

2.2 Musical framework: introduction

The following section is divided into four parts. First, I will refer to the relationship between music and language, I will compare and examine the views of some of the most influential authors in the field. In the second subsection, I will refer to the musical method used in the research and the reasons why it was chosen. In the third subsection, due to its relevance for the present research, I will review some of the latest findings in the field of neuroscience, regarding the relationship between music and language. Finally, I will look into the latest studies in relation to the connection among musical aptitude, musical training, and linguistic skills.

2.2.1 Music and language

In comparing the acquisition of music and the acquisition of speech, one must take into consideration the similarities of music and speech. Music and spoken language are both aural phenomena and thus share common characteristics. The rhythm and melody of music can be compared to stress and intonation (Arleo, 2006). Intonation is music. When we talk about English intonation we mean the pitch patterns of spoken English, the speech tunes or melodies, the musical features of English. Fonseca (2000) states that both, language and speech stem from the processing of sounds, they are used by their authors/speakers to convey a message, although language is much more precise than music, whose effect is mainly emotional. Fonseca (2000: 147) also points out that music and language have intrinsic features in common, such as pitch, loudness, prominence, stress, tone, rhythm, and pauses. Another shared feature of language and music is that we learn both of them through exposure. No language can be acquired without oral or written input and in a similar fashion, we acquire our notions of music from what we hear around us, which is why music from other cultures often sounds strange to us when it is different from the patterns of sounds and rhythms to which we have grown accustomed.

2.2.2 The musical method

The musical method used consisted on a series of exercises and activities adapted from the Martenot musical method, Gilbert video and others of my own creation. In what follows, I will describe them briefly.

The idea of using a musical method came from the idea behind Melodic Intonation Therapy (MIT). This is a method that was developed in the year 1973 by the neurological

researchers Sparks, Helm, and Albert to help patients suffering from aphasia, a disorder characterized by the loss of ability to produce and/or comprehend language. This treatment uses the musical elements of speech (melody & rhythm) to improve expressive language by capitalizing on preserved function (singing) and engaging language-capable regions in the undamaged right hemisphere. The idea of this research study was to do exactly that, i.e. to use singing and other musical elements to engage the regions of the right hemisphere and improve language; therefore, the musical method that was used was one that helped to link these two aspects. According to Patel (2011) essential conditions must be met in order for musical training to drive adaptive plasticity in speech processing networks. Musical training can involve different skills depending on what instrument and what aural abilities are being trained; therefore, the benefits of musical training will depend on the particular acoustic features emphasized in training, the demands that music places on those features in terms of the precision of processing, and the degree of emotional reward, repetition and attention associated with musical activities. Some elements from the Martenot musical method fulfil these purposes and include language exercises associated with rhythm and intonation as well, thus serving the purpose of linking music and language in a gradual way, starting with auditory training and finishing with accurate production. Martenot (1957) proposes to arouse the musicality of the students through games and playful musical proposals in which music, melody, and harmony are presented in a separate way. Music is understood as energy liberating, a powerful factor of harmony and balance which allows the students to express themselves freely and train their hearing before getting into intonation. Martenot poses that an appropriate intonation depends on accurate listening and he goes on to explain that this should be achieved following a certain order. The first

element to be dealt with should be rhythm. The idea, according to this author, is to express the living rhythm inside every human being.

One of the advantages of the Martenot method for this study in particular, is that it includes the memorization of rhythmic patterns and relates them to phrases; thus, connecting rhythm to language. These phrases were included during the rhythmic phase of the intervention in order to make participants feel the rhythm inside. As was mentioned earlier in this section, Patel (2011) points out that the benefits of musical training will depend on the acoustic features emphasized; therefore, the acoustic feature to be emphasized with this particular feature of the method is rhythm.

Gilbert (2011) proposes the use of the kazoo for training pitch accent realization, as well as the idea of choral repetition to ensure confidence. According to her, students feel more confident when they are repeating in a group; choral repetition helps learners to build confidence because they have the support of the group. These ideas were also used during the sessions.

In addition to all the aforementioned elements, some other activities of my own creation and adaptation were included, such as the use raps, popular songs, and nursery rhymes for pitch accent identification and the use of the kazoo for reading the three-stage Montessori cards.

2.2.3 Research on neuroscience

There are numerous studies from the field of Neuroscience regarding the relationship between music and language. Näätänen et al. (2005) state that each sound repetition, both speech and non-speech, develops its neural representation in the auditory cortex. Without proper neural models formed in the auditory cortex for the phonemic

combinations and prosodic patterns to be pronounced, the learning of a foreign language will not reach the targeted level (Näätänen, 2001: 17). Similarly, a musician needs accurate neural representations for tones in order to be able to learn to play the instrument in tune and in time. This skill is required, for example, with string instruments where the quality of the sound produced depends on the player's ability to listen and correct his/her own production. Thus, perceiving music and speech seem to depend upon subtle and accurate auditory processing skills, enabling the correct production of an intended output. Functional MRI has highlighted, for instance, that similar networks of brain structures are activated by music and language processing (Maess et al., 2001; Zatorre et al., 2002; Koelsch et al., 2002, 2004; Brown et al., 2004; Vigneau et al., 2006). Similar findings have been reported in studies which show that the younger the subjects start playing an instrument, the greater the effect on the brain structure or function (Elbert et al., 1995; Pantev et al., 1998). Nevertheless, in the present study, the participants' age will not have a crucial role in the accuracy of the pronunciation skills; instead, musical aptitude and musical training are supposed to be the key for developing foreign language intonation skills.

Musical training seems to drive adaptive plasticity in speech processing networks. Kraus and Chandrasekaran (2010) raise an important point: years of processing pitch, duration, and timbre in a fine-grained way in music may enhance their processing in the context of speech. Similarly, Patel (2011) states that music-driven adaptive plasticity in speech processing occurs because five essential conditions are met: there is anatomic overlap in the brain networks that process acoustical features used in both speech and music; there is precision: music places higher demands on the networks than does speech in terms of the precision of processing; repetition: music requires constant repetition; emotion: the musical activities that engage these networks produce strong positive emotions and

finally attention: the musical activities that involve these networks need constant attention. Patel also states, when these conditions are met, neural plasticity drives the networks in question to function with higher precision than needed for ordinary speech communication and yet, since speech shares these networks with music, speech processing benefits (Patel, 2011:6).

2.2.4 Musical aptitude and neurolinguistics

Given the structural and acoustical similarities between speech and music and possible overlapping cerebral structures in speech and music processing, the positive impact of musical aptitude and musical training on linguistic skills has been reported by several authors. For instance, a study by Slevc and Miyake (2006) showed a strong correlation between musical aptitude and second language listening discrimination and production skills among native Japanese who were immersed in English after the age of 11. In the same vein, (Anvari et al. 2002) stated that musical training seemed to relate to phonological processing ability in preschool children. More recently, Milovanov et al. (2008) have investigated the relationship between musical aptitude and second language pronunciation and phonemic discrimination skills. Twenty children with advanced English pronunciation skills demonstrated to have better musical skills as measured by the Seashore musical aptitude test than twenty children with less advanced pronunciation skills. In another experiment, probably the closest to this study, Milovanov et al. (2010) examined second language production and discrimination skills in the light of musical aptitude. The study was conducted in university settings in south-western Finland. All the participants performed equally well in the phonemic listening discrimination task. However, the participants with higher musical aptitude were able to pronounce English better than the

participants with less musical aptitude. The results, therefore, imply that musical and linguistic skills are interconnected. In their study the authors suggest that the prosodic features of speech should also be taken into consideration due to their importance and connection to musical features.

The role of possibly shared neural mechanisms between linguistic and musical functions is still unclear, even though there is evidence that musical training improves sensory encoding of dynamically changing sounds, which helps with linguistic coding. During the last decades many researchers from a wide variety of fields have claimed the positive effects that music instruction can have in the learning of languages. There are several studies that recognize that second language pronunciation of segments is better in students with high musical aptitude but there seems to be a lack of research in relation to prosody and an absence of a method that links music and prosody. The present dissertation intends to fulfil both needs.

CHAPTER 3: METHODOLOGY

In this chapter, I will provide a brief explanation of the procedures used to carry out this study, how the groups were formed, the different instruments that were used, the pedagogical intervention, and the data analysis procedures.

3.1 Description of the study

The research corresponds to a semi qualitative and quantitative quasi-experimental research, which aimed at comparing the effectiveness of two different methods for training TEFL students' intonation and sentence accentuation.

There was an experimental group with an independent variable identified as pedagogical intervention, which consisted of eight sessions of training for sentence intonation and sentence accentuation using a musical method. The control and experimental groups went through the current teaching methodology for the intonation course, i.e. they had two sessions of 90 minutes per week with the traditional method. The control group was not to be manipulated through any kind of musical training. The effectiveness of the independent variable was contrasted with the dependant variables, i.e. participants' correct placement of prenuclear and nuclear accents and appropriate tonal realization of pruclear and nuclear accents.

Within its qualitative design, the investigation also included features of correlational descriptive research. It seeks, for instance, to determine the relationship between the level of musical aptitude and better results after the pedagogical intervention.

3.2 Sampling

The participants were seventeen upper intermediate English university students, ten women and seven men. They were selected from the TEFL undergraduate programme at Universidad Metropolitana de Ciencias de la Educación (UMCE) located in Santiago, Chile. As a requirement, the students needed to be participating in the intonation course (sixth semester of the Phonetics course). They had to be native speakers of Chilean Spanish and speakers of English as a foreign language. They were divided into two groups: the control group, with eight participants and the experimental group with nine participants. The participants were selected considering their willingness to participate and their levels of musical aptitude; there were students with different levels of musical aptitude (low, medium, and high) in each group (see section 3.3.1). Both groups were instructed using the same reference examples for sentence accentuation. At the end of the process two post-tests were applied. The course marks for oral production before and after the pedagogical intervention were compared in order to find any possible correlations between them and the results of the post-tests.

3.3 Instruments

To conduct this research three types of methodological instruments were used: a musical aptitude test, which identified students' aptitude in relation to rhythm and melody; a post-training evaluation questionnaire, which provided information in relation to the extent to which the pedagogical intervention was helpful for the participants; and two post-tests, which supplied input in relation to the participants' nucleus placement and realization of nuclear and prenuclear accents. These instruments were assessed during the process, the first before the pedagogical intervention and the two last ones after it.

In what follows, a detailed description of each instrument is provided.

3.3.1 Musical aptitude test

The first step was to measure the level of musical aptitude of the participants. In order to fulfil this purpose, participants were tested using a musical aptitude test provided by the Music Department of UMCE (see appendix A). They were tested in the following parameters: rhythmic memory, auditory memory, and form perception. The participants'

performance for each category was measured and the average of their overall performance was used to form the experimental and control groups. The following percentages were considered: High musical aptitude: over 70%, medium musical aptitude: between 40 and 69%, and low musical aptitude: between 0 and 39%.

The distribution of the participants in relation to this test is represented in the charts below. There were four students with high musical aptitude, three with low musical aptitude and one with low musical aptitude in the control group.

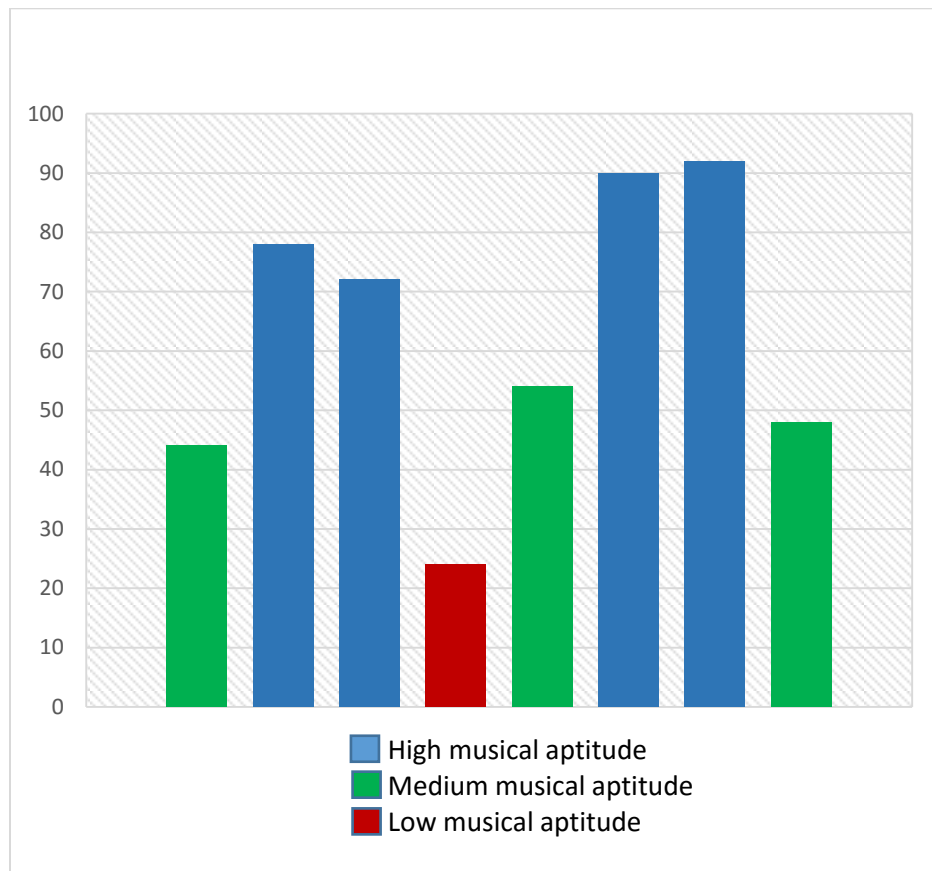


Chart 1. Percentages of musical aptitude in the control group

There were five students with high musical aptitude, one with medium, and three with low musical aptitude in the experimental group.

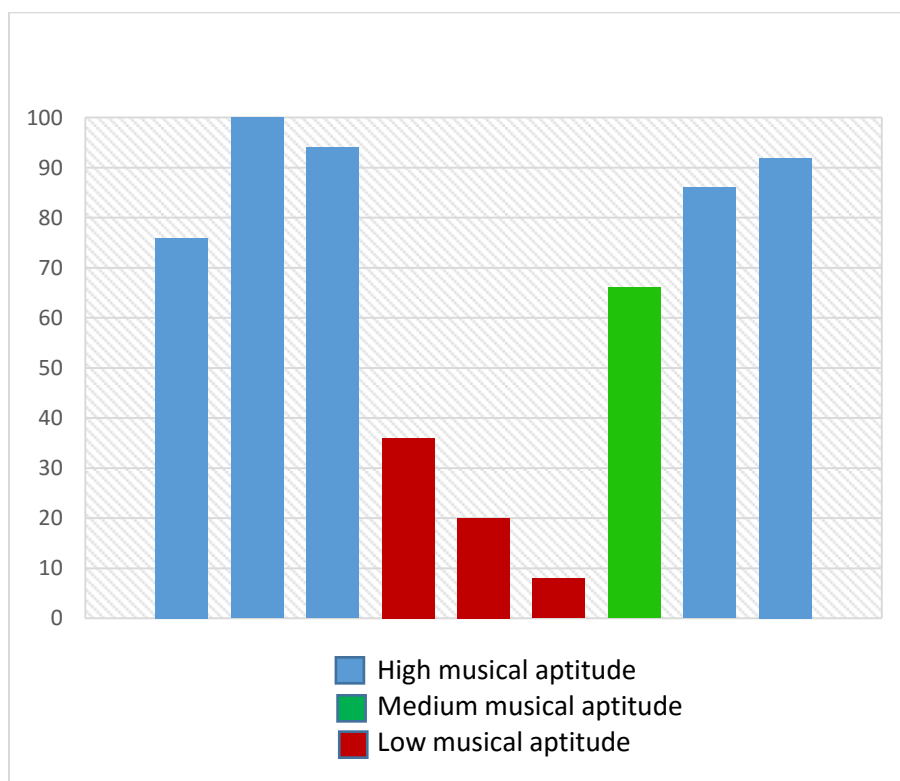


Figure 2. Percentages of musical aptitude in the experimental group

3.3.2 Post-tests

There were two post-tests: post-test 1, which did not show marked accents, where the participants had to read some sentences and a mini dialogue and decide where to locate the prenuclear and nuclear accents and post-test 2, which showed marked accents, where participants had to produce prenuclear and nuclear accents with correct location and pitch. To design the tests, it was considered advisable to resort to sentences and conversational exchanges which provided problematic accentuation patterns for Spanish speakers (see section 2.1.6). Five of these patterns correspond to sentences in broad focus with an earlier nucleus, which are exceptions to the LLI rule, such as event sentences, final relative clauses, wh-questions ending in a verb, nouns + adjectives and participles, and transitive

verbs + object + adverbial particle, and the others, which are sentences in narrow focus such as given information.

In order to test their validity eight sentences and two mini-dialogues were written and then submitted to three native speakers to read and record. During the post-tests, participants from the control and experimental groups were asked to read the sentences. They had five minutes to read the sentences in silence. Then, the sentences were recorded onto a computer programme (a CD containing the recordings of the participants accompanies the dissertation).

Find below sentences for the post-tests 1 and 2

Post-test 1

1. You left the water running.
2. What about that woman you were going out with?
3. Whose car did you borrow?
4. At least you could have turned your mobile off.
5. A: Follow that car!
B: Which car?
A: The blue one with the bad guy in it!

Post-test 2

1. The `kettle's boiling.
2. 'What about that `man you've been dating?
3. 'How much `water do you drink?
4. I for'got to let the `dogs loose.
5. A: Ar'rest that `man!
B: `Which man?
A: The 'tall one with a red `cap on.

3.3.3 Post-training evaluation questionnaire

This instrument measured to what extent the participants considered the pedagogical intervention useful, as well as what activities and resources they found more effective. The results of this questionnaire are relevant for the decision-making process of future training involving this method. In order to interpret the information provided by these tests students' answers were translated into quantitative data. The activities that the student found more useful according to the results provided by this questionnaire are described in detail in section 3.4.2. The questionnaire is included in appendix B.

3.4 The pedagogical intervention

The experimental group had eight sessions of training with the musical method (described in section 2.2.2). The intervention lasted four weeks, each of which was comprised of two sixty-minute sessions. On the other hand, the control group continued with the traditional training and had no additional training.

3.4.1 The procedures applied in the experimental group

The sessions consisted of a series of exercises proposed in the Martenot method, some activities adapted from Gilbert (2011), as well as others of my personal creation (see section 2.2.2). All of them varied in degree of difficulty from session to session and were connected to accentuation and intonation. The first session of the intervention is described below, as well as the activities the participants found more relevant to their learning according to the results provided by the post training evaluation questionnaire. All of the activities are organized in terms of the objective they were intended to achieve. In addition, lesson plan 1 in the format used in the English department at UMCE is enclosed in appendix C. A description of lesson 1 is as follows:

Lesson 1

Objective: to develop the rhythmic sense.

Activity 1: Rhythmic patterns

The teacher produces a rhythmic pattern using syllable *-la*, which participants repeat. Then, they memorize the mentioned pattern and repeat it when the teacher indicates.

Activity 2: Expressive formulas

This activity is a variation of the previous one; this time the participants change the pitch pattern while keeping the same rhythmic pattern. The pitch patterns used involve, for instance, differences between affirmative versus interrogative forms and attitudinal features such as excitement, astonishment, sadness, etc.

Activity 3: Marches

First, participants stand in a circle. The teacher produces a rhythmic pattern and starts to march saying the mentioned pattern while marking the beat by stamping her feet. Students follow the teacher. Then, they march while keeping the rhythm and clapping the rhythmic pattern. Finally, they repeat the activity but this time instead of clapping the rhythmic pattern they tap their right index on their left palm.

Activity 4: Relating rhythmic patterns to language phrases

While marching, participants say phrases such as: *What are you doing?*, *Good afternoon*, *It's getting late*, as if they were part of a song. They march and show the nuclear accent with bodily movements assigned by the teacher, e.g. they lift their arms when the nuclear accent is produced or they raise a fist.

Activity 5: Evaluation

In pairs, participants make up other phrases or sentences that have the same prenuclear and nuclear accents as those in the last activity and they take turns to lead the group.

3.4.2 Activities the students found more relevant

According to the results provided by the post-training evaluation questionnaire the activities that students found the most relevant for their training were those which included the use of the Kazoo and an activity called bouncing balls. The activities will be described below.

Example of an activity using the kazoo

Objective 1: to locate prenuclear and nuclear accent

Objective 2: to realize pitch accents appropriately

The teacher shows sentences without marked accents on the board and participants take turns to reproduce them using their kazoos using first choral repetition and then individually. After each turn, the teacher marks the prenuclear and nuclear accents the participants are producing and asks the class if they think the accents were correctly located.

Bouncing balls

Objective: To relate musical intonation to sentence intonation

Participants sit in a circle with their eyes closed. The teacher plays a note on the keyboard and one of the participants, selected by the teacher, reproduces the same pitch with the syllable *-bam*, maintaining the sound for four beats. Then, the participant that is sitting next to the one who started, takes a turn trying to keep the same pitch. The sound bounces from one participant to the other for one round until all the participants have a turn. This is repeated four times with different pitches.

3.5 Data analysis procedures

In this subsection I will describe how the results obtained were analysed. First, I will refer to the posts-tests, then I will continue with the oral production averages, and I will finish with the post-training evaluation questionnaire.

First, the recorded material produced by the participants for the post-tests was assessed in terms of correct prenuclear and nuclear accent placement in post-test 1 and appropriate prenuclear and nuclear accent realizations in post-test 2. Each correct prenuclear accent was assigned 1 point and every correct nuclear accent was assigned 2 points. The results were discussed and agreed upon with the thesis supervisor. Then, the average scores obtained by the experimental and control groups in post-tests 1 and 2 were compared. In addition, the

results achieved by the participants of the experimental group with high musical aptitude were compared with those obtained by the participants with medium and low musical aptitude. This was done in order to find out which participants were more benefited by the musical training.

On the other hand, the oral production averages per group before and after the pedagogical intervention were compared in order to detect any possible correlation. In addition, the attainment of the weakest participants from each group was compared in order to find out which of the two types of training had a greater impact for students learning. Finally, the answers to the post-training evaluation questionnaire were quantified and analysed to discover to what extent the participants found the pedagogical intervention beneficial to their learning process.

CHAPTER 4: RESULTS AND DISCUSSION

4.0 Results

This section is divided into four parts. In subsection 4.1, I will present the results obtained by the control and experimental groups in the post-tests 1 and 2. In subsection 4.2, I will turn my attention to the individual results of the experimental group, illustrating the participants' level of musical aptitude and their achievement in terms of number of correct placement and realization of pitch accents. In subsection 4.3, I will compare the oral production mark averages obtained in the intonation workshop by the control group and the experimental group, before and after the pedagogical intervention, as well as the attainment of the weakest students of both groups, in order to determine if they benefited from any of the types of training received. In subsection 4.4, I will examine the results of the post-training evaluation questionnaire. Finally, in subsection 4.5, I will discuss the results previously presented.

4.1 Posts-tests results

The charts below illustrate the results obtained by the control and experimental groups in the post-tests after the pedagogical intervention. The results for post-test 1 are on a scale from 0 to 18 points, where 0 is incorrect prenuclear and nuclear pitch accent placement and 18 is the ideal score. The answers were considered correct with any type of pitch accent (e.g. high fall or low fall) the most important was the correct placement of the accent. The results for post-test 2 are on a scale from 0 to 19 points, where 0 is incorrect prenuclear and nuclear pitch accent realization and 19 is the ideal score.

4.1.1 Results of post-test 1

As chart 3 shows, the experimental group has a higher average score in post-test 1, the test that did not include marked accents. There is a difference of 4.3 points between the two groups.

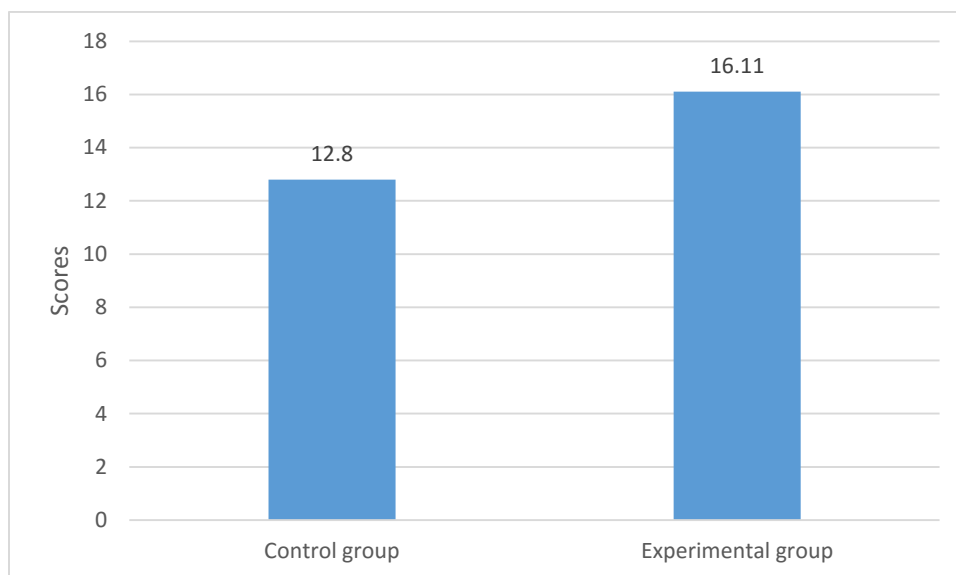


Chart 3. Comparison of the average results of the control and experimental groups for post-test 1

As can be seen in chart 4, the box plot shows the median score for each group, which in this case represents the score obtained by the participants who were in the middle of the distribution. The whiskers indicate the highest and the lowest scores in each group. In this particular case, the highest score of the experimental group ties in with the highest score of the control group, which means there were students who achieved the ideal score for this post-test in both groups. As can be seen in the lower part of chart 4, there were lower scores in the control group than in the experimental group. In the control group the lowest score was 9 and in the experimental group it was 12, i.e. 3 points higher than the control group. The box plot in the experimental group is much higher, which can be interpreted as the result of something different happening to this group; in this case the pedagogical intervention.

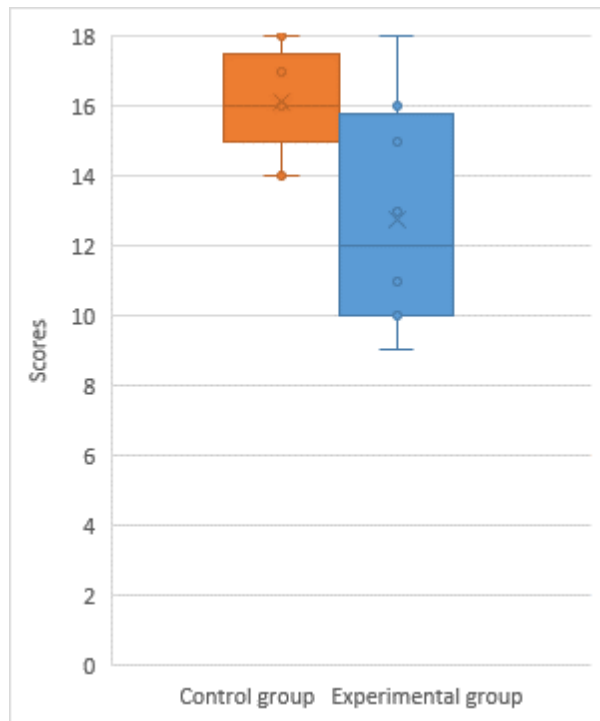


Chart 4. Comparison of the results of post-test

4.1.2 Results of post-test 2

The findings indicate a favourable difference for the experimental group. The average score of this group was 2 points higher than the control group.

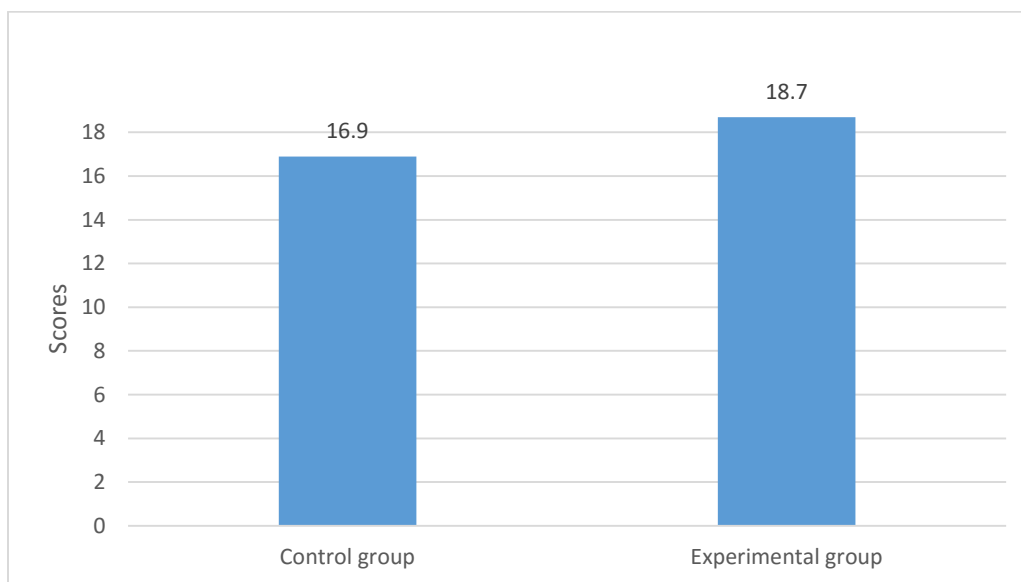


Chart 5. Average results of the control and experimental groups for post-test 2

Chart 6 shows that the box of the experimental group is not visible because the scores were all 19 points, which, as well as being the mean and median score for this group, is the maximum score. The lowest score for this group was 17. On the other hand, the control group has a more widespread distribution of scores. Its median score was 17 and its lowest score was 8. It is relevant to observe here that the experimental group's median score is at the lowest end of the control group scores. Additionally, the median score of the control group is the same value of the lowest score of the experimental group. We can assume that this result was due to the intervention.

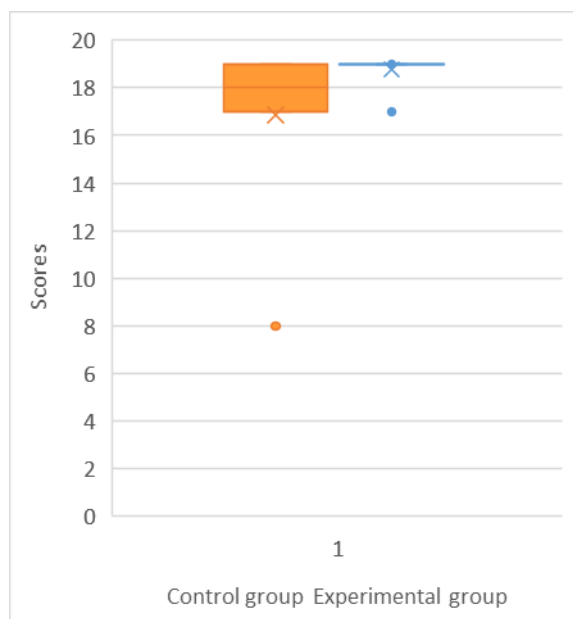


Chart 6. Comparison of the results for post-test 2

4.2 Correlation between the post-tests results and musical aptitude

The purpose of this analysis is to find possible correlations between the level of musical aptitude and the results of the test to find out whether the musical method was more helpful for participants with high, middle, or low musical aptitude. The percentages of musical aptitude for each participant are included showing high musical aptitude in blue, medium in green, and low in red.

4.2.1 Individual results of the experimental group for post-test 1

Chart 7 shows that two of the students with low musical aptitude from the experimental group obtained the highest scores in this test. Another interesting detail to observe is that the participants with high musical aptitude did not achieve scores as high as the participants with low musical aptitude; the highest score for high musical aptitude is 17.

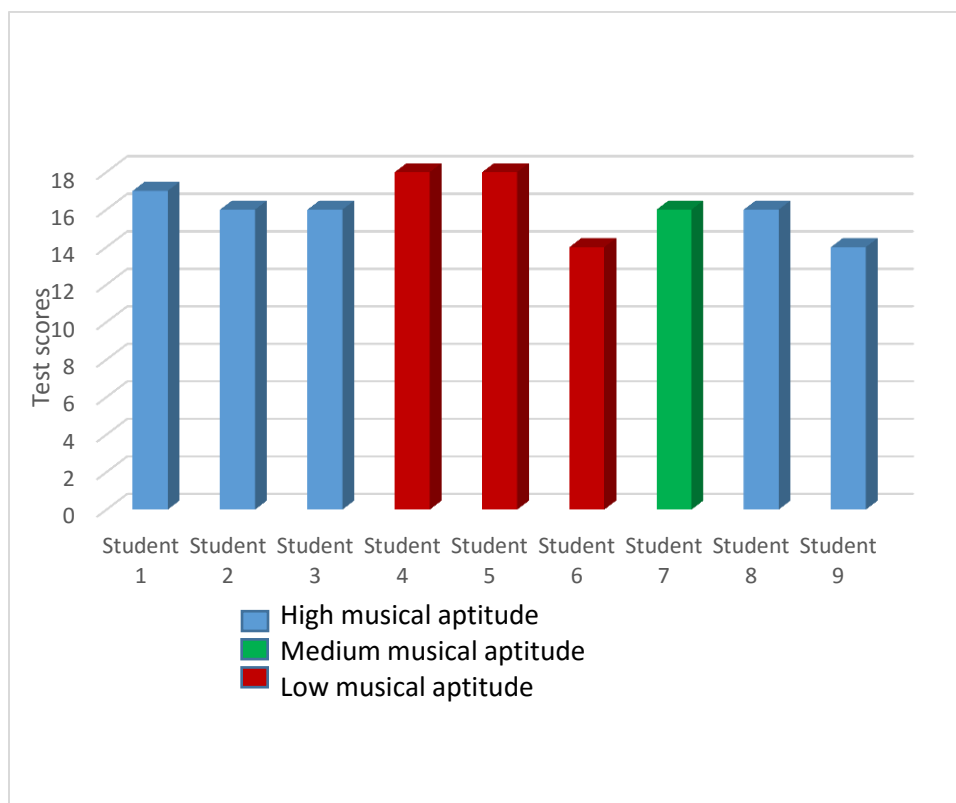


Chart 7. Results of post-test 1 illustrating the level of musical aptitude

4.2.2 Individual results of the experimental group for post-test 2

Post-test 2 differed from post-test 1 because it had marked accents; therefore, the participants did not have to place the pitch accents, they only had to realize the marked prenuclear and nuclear accents appropriately. As can be seen in Chart 8, the results of the experimental group were high for all types of musical aptitude, except for one of the participants with high musical aptitude, who obtained a slightly lower score, 17 points.

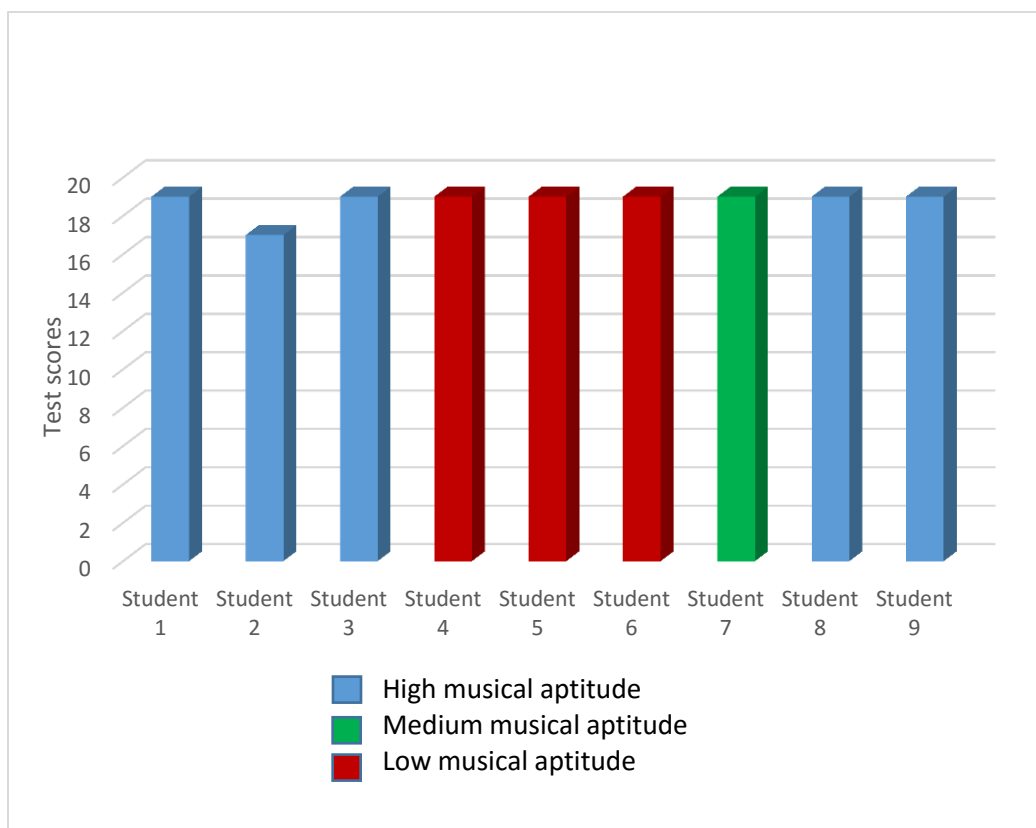


Chart 8. Results of post-test 2 illustrating the level of musical aptitude

4.3 Attainment of control and experimental groups before and after the pedagogical intervention

The charts below give an account of the average marks each group obtained for oral production in the intonation workshop before and after the pedagogical intervention. These averages are on the Chilean scale from 1.0 to 7.0 and they are an indicator of the students' performance in oral production.

4.3.1 Comparison of oral production average marks of the control and experimental groups

Chart 10 shows the mark averages for oral production in the intonation course from the control group before and after the pedagogical intervention. The average is almost the same as in the middle of the semester; it only varied from 6.3 to 6.34.

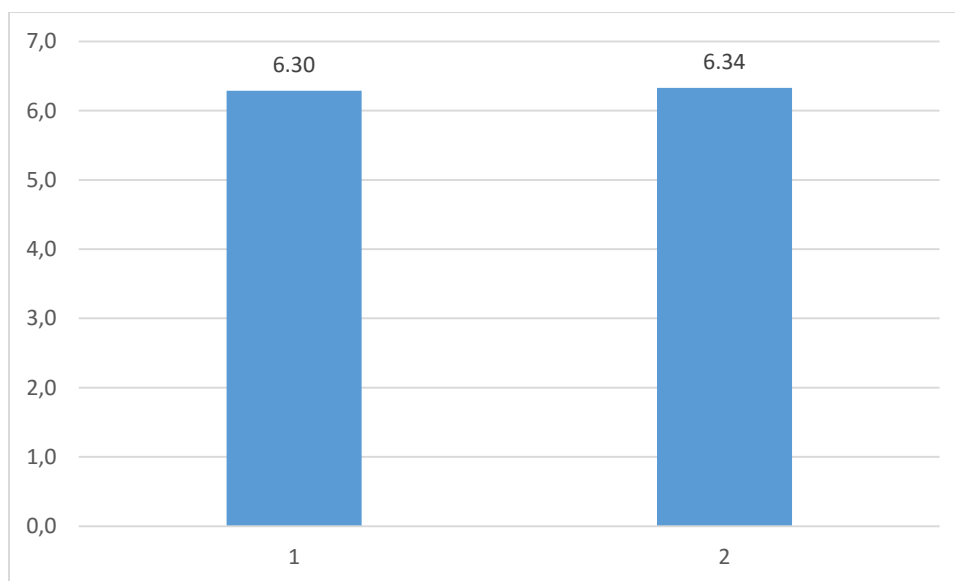


Chart 10. Mark averages for the control group before (1) and after (2) the pedagogical intervention

As can be seen in Chart 11, the average marks of the experimental group had 0.3 increase after the pedagogical intervention.

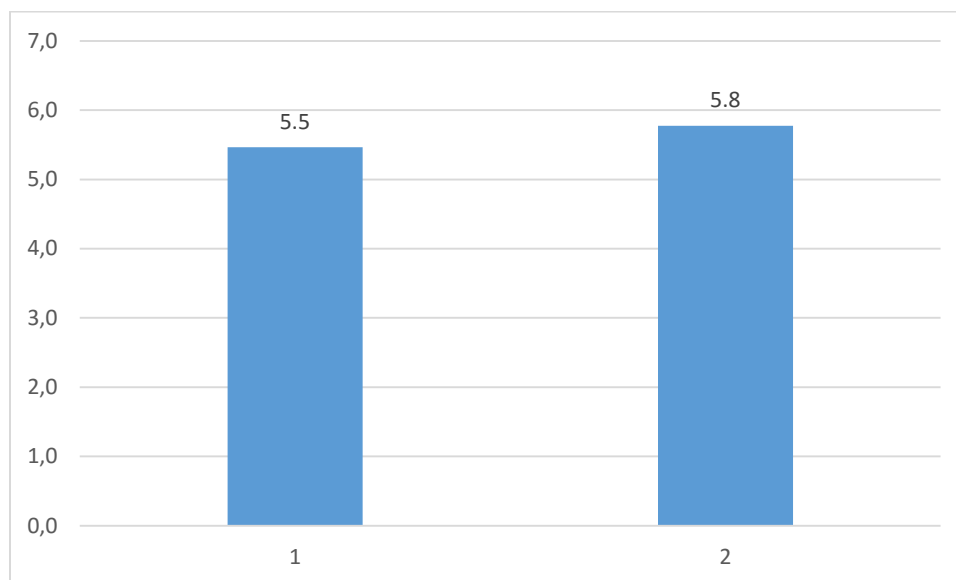


Chart 11. Marks averages for the experimental group before (1) and after (2) the pedagogical intervention

4.3.2 Attainment of the weakest participants of the control and experimental groups in the intonation workshop

The marks of the participants in the control group were comparatively higher than in the experimental group; there were only 3 students whose mark was below 5.8. Therefore, for purposes of this comparison, students were considered weak if they had an average mark below 5.8. As can be seen in chart 12, there were 3 weak students in the control group and their averages increased a maximum of 0.3 after the training with the traditional method. Furthermore, there was a student whose mark increased only by 0.1.

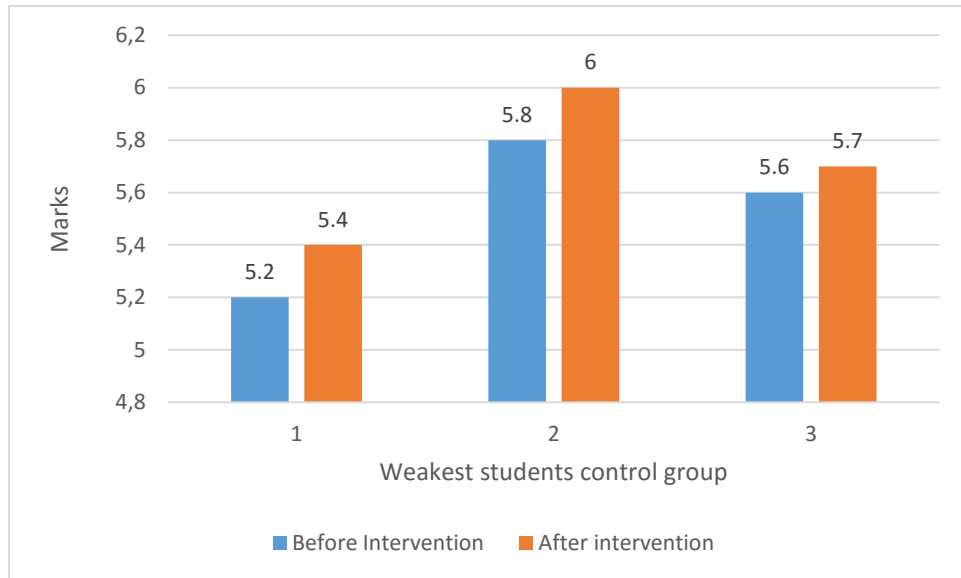


Chart 12. Weakest students in the control group

On the other hand, there were seven students who were considered weak in the experimental group. Chart 13 shows that all weak students had an increase after the pedagogical intervention. Some averages increased as much as 0.8 and the participant that had the least improvement increased by 0.2.

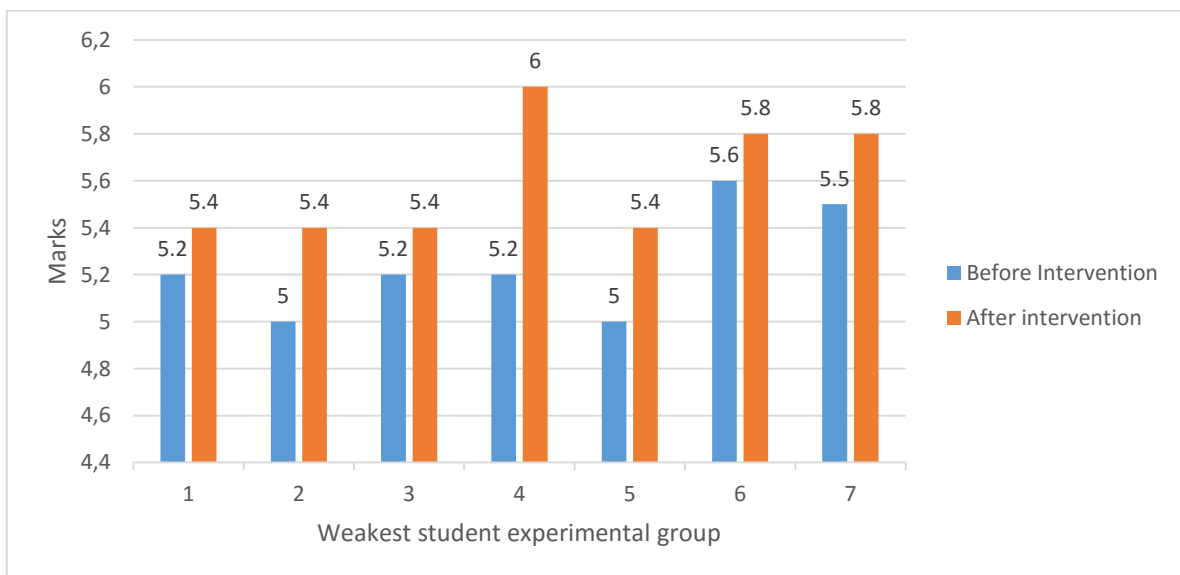


Chart 13. Weakest students in the experimental group

4.4 Results of the post-training evaluation questionnaire

The post training evaluation questionnaire was applied to find out the participants' opinions in relation to the relevance of the activities, the time allotted to the sessions, and extent of confidence they gained as a consequence of the intervention. The answers were quantified and the results can be found in the tables below. The questionnaire and more details about the answers to it can be found in appendix 3.

4.4.1 Overall impression of the sessions

According to table 1, 3 out of the 8 participants who responded coincided on the use of the kazoo as the most interesting or impressive element from the pedagogical intervention. The relationship between music and phonetics was another coincidence; 2 out of 8 students agreed on this.

Answers	Frequency	Total number of participants
Relationship between music and phonetics	2	8
The use of the kazoo	3	8
Other responses	3	8

Table 1. Frequency of responses to the statement: *What impressed me or interested me the most from the sessions*

4.4.2 Relevant activities

As can be seen in table 2, the activities that the participants found more relevant were the use of the kazoo and bouncing balls, which had 3 out of 8 preferences each. It is also

interesting that there were 2 participants who found all the activities relevant. Participants could select more than one activity in this part of the questionnaire.

Relevant activity	Frequency
Use of the kazoo	3
Bouncing balls	3
Montessori three-stage cards	2
Creating raps and melodies	1
Uttering a sentence in a specific tempo	1
All of them	2

Table 2 Frequency of responses to the statement: *The activities that were relevant...*

4.4.3 Irrelevant activities

As shown in table 3, six out of the eight students of this group responded that none of the activities was irrelevant.

3. Responses to the	Activity	Frequency	Total number of participants
	None	6	8
	Marching	1	8
	Repetition of some of them	1	8

statement: *The activities that were not relevant...*

4.4.4 Extent of confidence gained through the intervention

It can be seen from table 4, that the students gained confidence in identification, differentiation, and realization of pitch accents; although the highest degree of confidence was obtained in the differentiation of nuclear and prenuclear accents, where the average was 4.3 and the maximum score was 5.

Score				
Statement				Average
Identification of pitch accents				3.8
Differentiation of nuclear and pre-nuclear accents				4.3
Realization of pitch accents				3.9
Not at all	Not well	Neutral	Well	Very well
1	2	3	4	5

Table 4. To what extent did you gain confidence in the following

4.4.5 Time allotted to the training

Table 5 shows the level of satisfaction that students had in relation to the time allotted for the pedagogical intervention. 7 out of the 8 students who answered this questionnaire agreed that the time was not enough.

Answer	Frequency	Total number of participants
Not enough	7	8
Enough	1	8
Too much	0	8

Table 5. Time allotted to the training

4.5 Discussion of the results

In this section a brief discussion of the results obtained from the different instruments will be presented. For the sake of clarity, this discussion will follow the order in which the results were presented.

4.5.1 Results of post-tests 1 and 2

Strong evidence of an improvement in accentuation skills of the experimental group is supported by the data. The different analysis demonstrated that the results obtained by the experimental group under the application of the musical method have revealed significant effects in comparison to those obtained with the traditional method in the control group.

The results of the post-tests 1 and 2 show a significant increase for the experimental group in comparison with the control group. Moreover, this increase is higher for post-test 1, which was considered more demanding than post-test 2, since the accents were not marked. Nevertheless, due to the small size of the sample, it would be very simplistic to claim that these results were caused only by the intervention with the musical training method. In fact, there are other factors which could have influenced the participants' performance in the tests, such as additional preparation outside the pedagogical intervention and individual effort, which were not accounted for.

4.5.2 Results according to the participants' musical aptitude

Regarding the benefit in relation to the musical aptitude of the participants, the results of the post-tests suggest, although not conclusively, that musical training was beneficial to all the participants. The most interesting finding is perhaps the fact that 2 out of the 3 participants with low musical aptitude obtained perfect scores in the most demanding test (post-test 1) and they all obtained perfect scores in post-test 2; this evidence leads me to hypothesize that the participants that were more benefited by the musical training were those with low musical aptitude.

4.5.3 Attainment of control and experimental groups in oral production before and after the pedagogical intervention in the intonation course

Regarding the intonation workshop mark averages, the findings clearly indicate that the experimental group was more benefited by the musical method than the control group by the traditional method. The mark average results indicate a marked increase by 0.3 points after the pedagogical intervention, which compared to the 0.04 points of the control group, is significant. In addition, there was a considerable upward trend for the experimental group in the comparison of the weak students' attainment in oral production before and after the period of instruction, i.e. all weak students from this group increased their average oral production mark in at least 0.2 and there was one participant who obtained an average 0.8 higher after the intervention. At this point I can hypothesize that, since the participants from the experimental group attended the traditional training sessions as well, the musical training could have complemented the traditional training for the experimental group; however, these more significant results could also be the consequence of personal motivation to study or extra practice outside the pedagogical intervention sessions.

4.5.4 Results of the post-training evaluation questionnaire

The findings clearly indicate that the participants were impressed by the relationship between music and language and the use of the kazoo. Similarly, the activities the participants found more relevant were those that included the use of this instrument. In addition, 3 participants selected an activity called bouncing balls, which was related to intonation (see section 3.4.2). Regarding the extent of confidence gained after the sessions, the participants reported to have gained confidence in identification, differentiation, and realization of pitch accents but they gained the highest confidence in differentiation of prenuclear and nuclear accents; an average of 4.3 out of 5. In conclusion, they found the intervention relevant to their learning because it made them gain confidence in specific competences related to pitch movement and accentuation. Finally, another detail that deserves special notice is that most participants, 6 out of 8, thought the time allotted to the sessions was insufficient. This suggests, although not conclusively, that they would have liked to have more sessions.

The inescapable conclusion which emerges from what I have said in this subsection is that the musical method had a significant effect in comparison with the traditional method and it was beneficial to the participants. Nevertheless, the small size of the sample makes one doubt that this desired effect was caused only by the intervention itself, or there were other factors, such as motivation or additional practice outside the sessions involved. The main conclusion to be drawn is that although the results are significant, further research including a larger sample size is needed in order to verify the validity of this study.

CHAPTER 5: CONCLUSIONS

5.0 Introduction

The current chapter concludes the dissertation by summarizing the findings presented in Chapter 4, as well as providing a conclusion of the whole research process. Firstly, I will recap the main findings concerning the results. Secondly, I will refer to the limitations of the study and finally, I will provide some directions for further research.

5.1 Findings

The purpose of the present research was to find out whether the use of musical training could be beneficial to TEFL students' learning of some of the prosodic features that they are expected to operate. As a final interpretation it can be said that the different analysis demonstrated that the results obtained by the experimental group under the application of the musical method have revealed significant effects in comparison to those obtained with the traditional method in the control group. The participants who took part in the pedagogical intervention, i.e. the experimental group, had more significant results than the control group in the post-test that measured location of post lexical accents. This post-test was considered the most demanding of the two post-tests because it did not have marked accents, i.e. the participants had to decide where to place the accents. Additionally, the results of the post-test 2, which consisted of the participants' oral interpretation of tones, were also more significant in comparison to the control group. In conclusion, the pedagogical intervention with the musical method had the desired effect; it benefited the participants in their choice of placement and realization of prenuclear and nuclear accents. The point for concern here is, if this desired effect was caused only by the pedagogical intervention or this acted as a complement to the traditional method. I am more inclined to believe that it was a complement.

On the other hand, the analysis provided information in relation to the attainment in oral production after the intervention, and the improvement of the experimental group was far more significant than that of the control group. In summary, all students who participated in the pedagogical intervention improved their oral production.

In addition, the opinions of the participants regarding the activities and sessions of the pedagogical intervention were positive; most of the participants found the activities relevant and the sessions helpful. In fact, they said it made them gain confidence in differentiation, identification, and realization of pitch accents.

5.2 Limitations of the study

As a direct consequence of the methodology used, the study encountered a number of limitations, which need to be considered. First, the sample was too small. Although the results are significant, the size of the sample does not allow generalization. This was mainly due to the situation UMCE was going through at the time of the research; the students were on strike and as a consequence the academic term was shortened. Therefore, when the students resumed their academic activities they had very little extra time and were not willing to participate in the research. Second, neither the skills nor the marks of the selected participants could be considered. This was also a consequence of the previously mentioned strike. It would have been ideal to have a more varied sample of participants with low, medium, and high marks in oral production. Finally, another limitation to be considered was a group of variables which could not be controlled, such as the hours of autonomous study, attendance, and motivation to study. These variables might have influenced the performance of some of the participants but there was no way to control any of them.

5.3 Directions for further research

An important task for future research will first be to replicate this study but this time, with a larger sample and, as suggested by the participants in the post-training evaluation questionnaire, for a longer period of time. Another very promising application would be to try different scenarios, such as year 1 TEFL students, or school students; in order to find out what the results are with learners who have no prior training and theoretical knowledge on the topic. On the other hand, it also seems necessary to do some methodological research to continue developing the musical method, considering the activities that were more relevant for the participants in this research, and adding others. Finally, it seems advisable to introduce this method as it was used, i.e. as a complement to

the intonation workshop for TEFL students, since I personally believe that theoretical knowledge is needed in order to understand and learn how sentence accentuation works.

REFERENCES

- Anvari, S.H., L.J. Trainor, J. Woodside & B.A. Levy. 2002. Relations among musical skills, phonological processing, and early reading ability in preschool children. *Journal of Experimental Child Psychology*, 83, 111-130.
- Arellano, S.I. & J.E. Draper. 1972. Relations between musical aptitude and second language learning. *Hispania*, 55(1) 111-121.
- Besson, M. & D. Schon. 2001. Comparison between language and music. *Annals of the New York Academy of Sciences*, 930, 232–259.
- Brown, S., M.J. Martinez & L.M. Parsons. 2006. Music and language side by side in the brain: a PET study of the generation of melodies and sentences. *European Journal of Neuroscience*, 23, 2791-2803.
- Cruttenden, A. 1997. *Intonation*. Cambridge: Cambridge University Press.
- Dankovicová, J., J. House, A. Crooks, K. Jones. 2007. The relationship between musical skills, music training and intonation analysis skills. *Language and Speech*, 50(2) 177-225.
- Elbert, T., C. Pantev, C. Wienbruch, B. Rockstroh & E. Taub. 1995. Increased cortical representation of the fingers of the left hand in string players. *Science*, 13, 305-307.
- Fonseca-Mora, C. 2000. Foreign language acquisition and melody singing. *English Language Teaching Journal*, 54: 147.
- Gilbert, J. 2011, June 23. Teaching pronunciation: seven essential concepts with Judy B. Gilbert [Video file]. Retrieved from <http://www.youtube.com/watch?v=BPmjGHdK5v8>
- Gussenhoven, C. 1983a. Focus, mode and the nucleus. *Journal of Linguistics* 19, 377–417. Reprinted in Gussenhoven (1984).

- Jaramillo, M., T. Ilvonen, T. Kujala, P. Alku, M. Tervaniemi & K. Alho. 2001. Are different kinds of acoustic features processed differently for speech and non-speech sounds? *Cognitive brain research*, 12, 459-466.
- Kingdon, R. 1958. *The groundwork of English stress*. London: Longmans, Green.
- Koelsch, S., E. Kasper, D. Sammler, K. Schulze, T. Gunter, & A. D. Friederici. 2004. Music, language and meaning: brain signatures of semantic processing. *Nature Neuroscience*, 7(3), 302-307.
- Ladd, R. 2008. *Intonational Phonology*. Cambridge: Cambridge University Press.
- Mackenzie Beck, J. 2003. Is it possible to predict students' ability to develop skills in practical phonetics? In *Proceedings of the 15th International Congress of Phonetic Sciences*, Barcelona, 2833-2836.
- Maess, B., S. Koelsch, T.C. Gunter & A.D. Friederici. 2001. "Musical syntax" is processed in the area of Broca: An MEG-study. *Nature Neuroscience*, 4, 540-545.
- Marin, O.S.M. & D.W. Perry. 1999. Neurological aspects of music perception and performance. In D. Deutsch, (Ed.). *The psychology of music*, 2nd edition. San Diego, CA: Academic Press, 653-742.
- Milovanov, R., M. Huotilainen, V. Välimäki, P.A.A. Esquef & M. Tervaniemi. 2008. Musical aptitude and second language pronunciation skills in school-aged children: neural and behavioral evidence. *Brain Research*, 1194, 81-89.
- Martenot, M. 1957 *Metodo Martenot. Solfeo, Formacion y Desarrollo Musical*. Ricordi Americana: Buenos Aires
- Näätänen, R. 2001. The perception of speech sounds by the human brain as reflected by the mismatch negativity (MMN) and its magnetic equivalent (MMNm) *Psychophysiology*, Cambridge University Press. 1-21.

- Näätänen, R., T. Jacobsen & I. Winkler. 2005. Memory based or afferent processes in mismatch negativity (MMN): A review of the evidence. *Psychophysiology*, 42, 25-32.
- Näätänen, R., M. Tervaniemi, E. Sussman, P. Paavilainen & I. Winkler. 2001. Primitive intelligence in the auditory cortex. *Trends in Neurosciences*, 24(5), 283-288.
- Ortiz, H. 1995. Nucleus placement in English and Spanish: a pilot study of patterns of interference. In J. Windsor Lewis (ed.) *Studies in general and English phonetics. Essays in honour of Professor J. D. O'Connor*. London: Routledge. Pp. 255-265.
- Pantev, C., R. Oostenveld, A. Engelien, B. Ross, L. Roberts & M. Hoke. 1998. Increased auditory cortical representation in musicians. *Nature*, 392, 811-814.
- Patel, A. D. 2011. Why would musical training benefit the neural encoding of speech? The OPERA hypothesis. *Frontiers in Psychology*, 2, 142.
- Peretz, I. 2002. Brain specialization for music. *Neuroscientist*, 8(4), 374-382.
- Peretz, I. 2006. The nature of music from a biological perspective. *Cognition*, 100, 1-32.
- Slevc, L. R., & A. Miyake. 2006. Individual differences in second language proficiency: does musical ability matter? *Psychological Science*, 17, 675-681.
- Tervaniemi, M., M. Rytkönen, E. Schröger, R.J. Ilmoniemi & R. Näätänen. 2001. Superior formation of cortical memory traces for melodic patterns in musicians. *Learning & Memory*, 8, 295-300.
- Vigneau, M., V. Beaucousin, P.Y. Hervé, H. Duffau, F. Crivello, O. Houdé, B. Mazoyer & N. Tzourio-Mazoyer. 2006. Meta-analyzing left hemisphere language areas: phonology, semantics, and sentence processing. *NeuroImage*, 30, 1414-1432.
- Vohringer, E. & O. Vejar. 2004. Prueba de aptitudes musicales rítmica y melódica UMCE
- Wells, J. 2006. *English Intonation. An Introduction*. Cambridge: Cambridge University Press.

- Zatorre, R.J. & I. Peretz. 2001. The biological foundations of music education. New York: *Annals of the New York Academy of Sciences*, 930, 232-258.
- Zatorre, R.J., P. Belin & V.B. Penhune. 2002. Structure and function of auditory cortex: music and speech. *Trends in Cognitive Science*, 6, 37-46.
- Zhao, X., Mauer, M.V., & Doyle-Smith, N. C. 2012. A general music background questionnaire based on Google Forms and Google Template. Talk presented at the 42nd annual meeting of the Society for Computers in Psychology, Minneapolis, November, 2012.

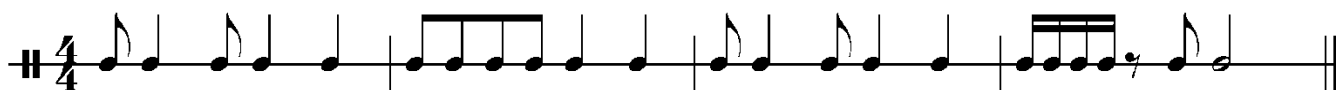
APPENDIX A: MUSICAL APTITUDE TEST

Prueba de aptitudes Musicales rítmica y melódica

Elaborada por los académicos E. Vohringer y O. Vejar

Rítmica:

Compás simple:



Compás compuesto:



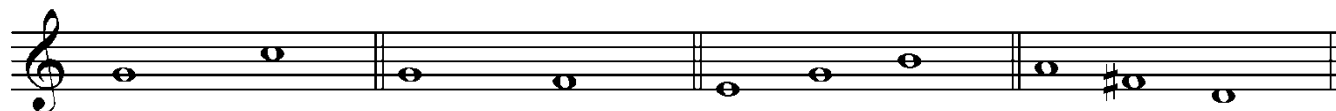
Melódica:

I Escalas



II Intervallos

Arpeggios



III Frases melódicas con acompañamiento

a)



b)



IV A capella

a)



b)



V Completación

a)

D G D A7 D

Exercise a) is a musical phrase in G major, 2/4 time. It consists of 8 measures. The notes are: G4 (quarter), A4 (quarter), B4 (quarter), A4 (quarter), G4 (half), F#4 (quarter), E4 (quarter), and D4 (half). The chords indicated above the staff are D (measures 1-2), G (measures 3-4), D (measures 5-6), A7 (measure 7), and D (measure 8).

b)

D G D A7 D

Exercise b) is a musical phrase in G major, 2/4 time. It consists of 8 measures. The notes are: G4 (quarter), A4 (quarter), B4 (quarter), A4 (quarter), G4 (half), F#4 (quarter), E4 (quarter), and D4 (half). The chords indicated above the staff are D (measures 1-2), G (measures 3-4), D (measures 5-6), A7 (measure 7), and D (measure 8).

c)

D A7 D D D

Exercise c) is a musical phrase in G major, 2/4 time. It consists of 8 measures. The notes are: G4 (quarter), A4 (quarter), B4 (quarter), A4 (quarter), G4 (half), F#4 (quarter), E4 (quarter), and D4 (half). The chords indicated above the staff are D (measures 1-2), A7 (measures 3-4), D (measures 5-6), D (measure 7), and D (measure 8).

APPENDIX B: QUESTIONNAIRE

Post-training evaluation questionnaire

Instructions: Please give your answers or comments in writing and indicate the extent to which you gained confidence in the topics you learnt on a scale of 1 to 5.

1. Overall evaluation						
1.1	What impressed me or interested me most was ... (please explain why)					
1.2	What facilitated my learning was ...					
1.3	The activities that were relevant to me were ...					
1.4	The activities that were not relevant or did not help were...					
1.6	The time allotted to the training was...					
2. To what extent did you gain confidence in the following?						
		Not at all	Not well	Neutral	Well	Very well
2.1.1	Identification of pitch accents	1	2	3	4	5
2.1.2	Differentiation of nuclear and pre-nuclear accents	1	2	3	4	5
2.1.3	Realization of pitch accents	1	2	3	4	5
2.1.4	How can I improve this module?					

Additional comments

.....

.....

.....

.....

APPENDIX C: LESSON PLAN 1

UNIVERSIDAD METROPOLITANA DE CIENCIAS DE LA EDUCACION
DEPARTAMENTO DE INGLES – METHODOLOGY

TEACHER: _____ Anita Aguilera _____

CLASSROOM N°: ____6__ TIME: _12:00_____

DATE OF CLASS: ____4/12/15____ TEACHING SESSION N°: ____1__

LESSON PLAN N° 1____

PERFORMANCE OBJECTIVE(S)	CONTENTS RELATED TO PERFORMANCE OBJECTIVE	INSTRUCTIONAL STRATEGIES	MATERIAL TO BE USED WITH THE INSTRUCTIONAL STRATEGIES	EVALUATION	SUGG . TIME FOR P.O.
Objective 1: to develop the rhythmic sense. Objective 2: to relate rhythmic patterns to language phrases	Relating sentence accent to rhythmic patterns	<p>Warm up</p> <p>Teacher greets student asks them how they are and if they have any questions about the intervention</p> <p>Act 1: rhythmic patterns</p> <p>The teacher produces a rhythmic pattern using syllable <i>-la</i>, which participants repeat. Then, they memorize the mentioned pattern and repeat it when the teacher indicates.</p> <p>Act 2: expressive formulas</p> <p>This activity consists on changing the pitch pattern while keeping the same rhythmic pattern. The pitch patterns used involve, for instance,</p>	Computer, speakers and data	<p>Evaluation</p> <p>In pairs, participants make up other phrases or sentences that have the same prenuclear and nuclear accents as those in the last activity and they take turns to lead the group.</p>	<p>5 min</p> <p>10 min.</p> <p>10 min</p>

		<p>differences between affirmative versus interrogative forms and attitudinal features such as excitement, astonishment, sadness, etc.</p> <p>Act 3: marches Participants stand in a circle. The teacher produces a rhythmic pattern and starts to march saying the mentioned pattern while marking the beat by stamping her feet. Students follow the teacher. Then, they march while keeping the rhythm and clapping the rhythmic pattern. Finally, they repeat the activity but this time instead of clapping the rhythmic pattern they tap their right index on their left palm</p> <p>Act 4: memorization of rhythmic patterns related to language phrases</p> <p>While marching,</p>			<p>12 min</p> <p>5 min</p>
--	--	---	--	--	----------------------------

		<p>participants say phrases such as: <i>What are you doing?</i>, <i>Good afternoon</i>, <i>It's getting late</i>, as if they were part of a song. They march and show the nuclear accent with bodily movements assigned by the teacher, e.g. they lift their arms when the nuclear accent is produced or they raise a fist.</p> <p>Act 5: evaluation (described in the evaluation section)</p> <p>Closure: teacher asks students their opinion about the session.</p>			<p>12 min</p> <p>6 min</p>
--	--	---	--	--	--